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1. As original communications the ARCHIVES can accept only such papers as have never been printed nor are intended to be printed in other journals. If a preliminary communication on the subject of a paper has been published, the author is requested to state this in the letter accompanying his manuscript. It is understood that contributors to these ARCHIVES and editors of other periodicals will make no abstracts of the original papers published in this journal without giving it due credit for the same.

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CONTRIBUTIONS TO THE STUDY OF THE PATHOLOGY OF THE MASTOID PROCESS.¹

BY DR. E. SCHMIEGELOW, COPENHAGEN.

Translated by Dr. S. E. ALLEN, Cincinnati.

(With two charts in the text.)

I TAKE the liberty of presenting to you the clinical history of two patients, as the cases, from a diagnostic as well as from a therapeutic standpoint awaken great interest. The first case treats of an extraordinary carious destruction of the temporal bone which, in the beginning, simulated the clinical picture of a fatal sarcoma, while the second treats of pyæmia occurring during the course of a chronic middle-ear suppuration. In this latter case, in spite of puncture of the transverse sinus and resection of a rib on account of septic empyæma, it was possible to bring about a cure.

At the end of the article I shall take the liberty of adding *in extenso* the history of a girl who was treated at the hospital for a sarcoma of the processus mastoideus.

I.—Chronic inflammation with extensive carious destruction of the temporal bone.—Mastoid region healthy.—Paralysis of right facial and hypoglossal.—Right-sided hemiatrophy of the tongue.—Operation.—Recovery.

Eberhardt Schlüssel, age twenty-two, consulted me the beginning of March on account of pain in the right ear and right side of head. He made the following statement : At age of six, during scarlatina, taken with a discharge from right ear. Thinks that

¹ Paper read before the Medical Society of Copenhagen, on December 20, 1892.

Reprinted from the ARCHIVES OF OTOLGY, Vol. xxiii., No. 1, 1894.

during childhood the ear did not run. Since then the hearing markedly diminished on that side. December 26, 1889, was taken with influenza, during which there developed *painlessly* a right-sided facial paralysis. February 20, 1890, consulted Dr. Windelschmidt in Cologne. Paralysis considered purely nervous and electrical treatment applied without benefit. After three or four months began to experience pain in the neighborhood of the ear. Consulted Dr. Keller, who made out a tumor in the meatus and tried to remove same with the galvano-cautery.

On November 25th he went to Berlin. Had periodical attacks of violent pain in the ear, and now and then pain in right side of head. No dizziness, nausea, ear noises, or similar symptoms.

June 3, 1891. Pain had increased so that he entered the otological department of the hospital. Report of Dr. Jansen: Complete right-sided facial and hypoglossal paralysis, with alterations in the vagus and sympathetic. Meatus closed by a hard tumor attached by a broad base to the posterior wall. Tumor not granulating, but covered entirely with epidermis. Not sensitive to pressure. No trace of suppuration. In depression between lower jaw and processus mastoideus a very sensitive enlarged gland. Along the neck other glands. From a microscopical examination of a portion of the tumor, in connection with the clinical history, a diagnosis of sarcoma was made. In a few months (August 14, 1891) patient dismissed as *unfit for operation*.

March 1, 1892. A few days before he consulted me for the first time, the pain had increased so that he could neither sleep nor work. Right side of head feels heavy, is dizzy when he walks, no appetite. Greatly reduced in weight, looks pale and miserable. Pulse, strong, normal. Pain on moving lower jaw. Swollen glands in right retro-maxillary region very sensitive to pressure. No sensitiveness or alteration in form about the mastoid process. Total paralysis of facial nerve. Tongue can only be extended a few *mm* beyond the teeth. Right side of the tongue atrophic. Voice and deglutition normal. No discharge from right meatus. Same filled by a moderately hard, dense, pale-red polyp, attached by a broad base to the posterior wall. Its surface covered with epidermis. Hearing in right ear for watch and whispering nil. Patient sent to St. Joseph Hospital, put to bed, and warm poultices ordered. Morning temperature, 38.1°.

March 2d.—Operation under chloroform. By means of a

curved incision the external ear was separated and together with the membranous meatus pushed forward. Meatus filled with polypi and cholesteatomatous masses. Bony canal destroyed to a great extent just medial to external opening. Granulations extend through the defect in wall of meatus into the processus mastoideus. Mastoid was then opened up. Immediately under the smooth, sound, but very thin (1-2 mm) cortical layer, a cavity as large as a walnut. Same filled with granulation tissue and cholesteatomatous masses. These removed with sharp spoon. Marked pulsation deep in. Dura exposed up to the posterior cranial fossa. In this direction the finger can be introduced to a depth of five cm from the surface of the process. Granulation tissue near the surface mixed with cholesteatomatous masses, deep in, exclusively granulations. Cavity extends forward into the middle ear. Same filled with granulations. Entire posterior wall of meatus was removed, bringing meatus and cavity in mastoid into communication. Cavity cleaned out with sharp spoon. Bleeding profuse. Wound tamponed with iodoform gauze, three sutures placed at the upper angle of the incision, and whole covered with cotton and bound.

March 3d.—Yesterday evening temperature 39.4°. This morning 38°. No headache.

March 5th.—Bandages changed, having become soaked through with blood.

March 21st.—Out of bed. Goes out and has commenced work. Facial and hypoglossal paralysis unchanged. The wound is dressed every third day and tamponed with iodoform gauze. There is some fetor. In the depth of the extensive cavity are numerous shreds of necrotic tissue. Understands half loud speaking in his immediate vicinity.

March 25th.—Cholesteatomatous masses and flabby granulations springing up in the posterior cranial fossa. These removed to-day with sharp spoon, spoon entering the posterior fossa to a depth of five cm from surface of mastoid.

Subjectively patient perfectly well. Paresis unchanged.

April 8th.—Subjectively perfectly well. Paresis unchanged. No dizziness. Appetite good. Cavity is very large and secretes a somewhat offensive pus. Deep in, gangrenous shreds.

April 10th.—Was taken this noon with severe attacks of dizziness, and vomiting. The attacks ceased in the course of half a day. He attributes same to over-exertion at work.

April 16th.—Well since last date. No dizziness. Electrical reaction of right facial nil. Right hypoglossal on the contrary reacts plainly to both faradic and constant currents, although much less than the left nerve. Sense of taste in the front half of the right side of tongue wanting. (Dr. Dethlefsen.)

April 19th.—Had another sudden attack of dizziness with vomiting, which disappeared suddenly after a couple of hours.

May 4th.—Similar attacks of dizziness.

May 9th.—General condition good. Cavity closing. No pain.

June 8th.—No attacks of dizziness during past month. Cavity filling up. Granulations healthy. Paralysis of tongue better.

Aug. 8th.—The wound behind the ear is healed. No secretion from meatus. The somewhat narrowed meatus opens up posteriorly and above into a cavity lying within the processus mastoideus. Whole covered with epidermis. Watch heard at one *cm.* Tuning-fork on head heard in right ear. Feels clear in his head. Paresis of facial and hypoglossal unchanged.

Oct. 12th.—Perfectly good health. Condition of ear same as on last date.

Dec. 16th.—Continued good health. Hears watch at a distance of 70 *cm.* and whispering at 2 *m.* The pale, markedly thickened *Mt* with handle of malleus can be seen through the meatus. Facial paresis unchanged. Hypoglossal paresis and hemiatrophy of the tongue have nearly disappeared.

Summary.—We have here to do with the case of a young man of twenty-two, who, at the age of six, contracts a suppurative otitis during an attack of scarlatina, and who up to December, 1889, has felt perfectly well. He then has an attack of influenza, during which a right-sided facial paralysis develops, and this paralysis is treated by electricity without the slightest benefit. After he has had the facial paralysis for three or four months, he is taken with pain in the ear; a tumor is perceived within the meatus, and he is put under otological treatment. The tumor operated upon during the following year constantly recurs. During this time exudation from the ear has only been present as the immediate consequence of operative treatment. Pain in the region about the ear occurs with varying severity. Long intermissions are broken by severe attacks of pain. The pain

radiates out over the right side of the head, and at last so increases that he can no longer work, and he is taken into the University ear clinic at Berlin.

He presented at his entrance all the signs of a complete right-sided facial and hypoglossal paralysis, and the auditory canal was entirely filled by a broad-based, epithelial-covered tumor attached to its posterior wall.

The processus mastoideus presented no diseased alterations other than these. In the retro-maxillary region and along the neck were swollen and sensitive glands. The diagnosis of sarcoma of the temporal bone was made, he was given iodide of potash, but operative treatment, with the exception of the excision of a piece of the polyp for microscopical examination, abstained from. On August 14, 1891, he was dismissed under the impression that he was not a fit subject for operation.

His condition remained about the same, although the pain seemed to be somewhat less, and during the past winter he was able to work as an engraver in a silverware manufactory. This state continued till the last days of February, 1892, when the pain in the head and ear increased so that he could neither sleep nor work, and on the first of March he consulted me in the very miserable condition described in the clinical history.

The case was not clear. I was, however, certain that I had to do with a grave affection, probably with a tumor of the temporal bone, and that this tumor stood in causative relation to the paralysis of the facial and hypoglossal nerves. The fact that the patient was a young and powerful man indicated that we had to do with a sarcoma which had attacked the facial canal, and at the same time had broken into the posterior cranial fossa and had worked its way toward the condyloid foramen, and had there destroyed the hypoglossal.

In operating on a sarcoma of the temporal bone, one not only has very little hopes of recovery, but runs the risk of having the patient die on the table from hemorrhage. Küster¹ reported a case where he operated upon a cavernous

¹ *Berliner kl. Wochenschrift*, 46, 1881. Ref. in *Arch. f. Ohrh.*, xviii., page 187.

sarcoma springing from the pyramidal portion of the temporal bone, and where he was obliged to stop on account of hemorrhage. The bleeding continued in spite of ligation of the common carotid, and the patient died one half hour afterward. The post-mortem revealed the internal carotid intact. The blood had come from the tumor itself.

On the other hand, however, cases have been reported¹ where a radical removal has been accomplished without immediately dangerous hemorrhage, and with the view of alleviating temporarily the distressing symptoms. Haug² mentions such a case. The patient died, however, three months afterward from meningitis due to a recurrence of the growth. Similar unfortunate cases appear in the literature.³ Whether one operates or not, death generally ensues in the course of a year from the beginning of the disease.⁴

Impressed by these facts, it was not very encouraging for me to operate upon a patient who, seven months before, had been dismissed from the University otological clinic of Berlin as not being a case for operation. And if I dared to make the attempt, it was partly out of consideration for the patient, who was so miserable that he wanted something done at any cost, and partly because I thought that after all the tumor might not be malignant but of inflammatory origin. The following facts urged this supposition and caused me to believe in the possibility of the non-sarcomatous nature of the trouble. First, it was remarkable that a sarcoma could remain confined to the temporal bone for more than two years without perforating the surface of the mastoid. In all the cases of sarcoma of the mastoid process hitherto referred to, fistulous tracts formed through the same in the course of a few months, the growth growing through to the surface, and at the same time penetrating deep into the cranium. In our case, on account of the paresis, we were obliged to assume that the latter had taken place. The mastoid region, however, contrary to the rule,

¹ See also Case 3 at end of this article, p. 21.

² *Arch. f. Ohrenh.*, xxx., p. 126.

³ See the citations in Haug's article.

⁴ In a case described by Vermeyne (*Trans. of Am. Otological Society*, 17th annual meeting, vol. iii., part 3) the disease did not attack the labyrinth until after seven years of total blindness.

was perfectly sound. Second, a purulent discharge was entirely absent. The ear had always been dry except just after the extirpation of the polypi. In all the reported cases of sarcoma, where the growth had extended into the meatus, there was an abundant fetid discharge, often accompanied by violent bleeding. These hemorrhages were absent in my case.

On operating, great was my astonishment to find the conditions mentioned in the clinical history. The granulations could not all be removed on account of the violent bleeding, neither was I successful in determining the condition within the tympanic cavity. The wound was, however, tamponed with gauze and a bandage applied.

The process of repair was afebrile with the exception of an elevation of 39.4° on the evening following. The effect of the operation was immediate. The pain and feeling of heaviness in the head disappeared and nineteen days after the operation the patient could go out and begin his work. He was treated at the clinic from that time till August 1st. The wound behind the ear healed, the discharge from the ear ceased, and the tympanic cavity became covered with epidermis. To remind him of his grave illness, there is at present, with the exception of the facial and hypoglossal paresis, a deep cicatrix behind the ear. The labyrinth is uninjured and the patient hears the tuning-fork on the head in the right ear.

During the after-treatment, the patient had two attacks of dizziness with vomiting, so that I feared the labyrinth had become affected, or that the growth had attacked the brain. The attacks, however, disappeared every time very quickly, which indicated that they were of reflex character. The patient himself ascribed them to over-exertion at work.

It must be further observed that twice during the after-treatment it was necessary to remove cholesteatomatous masses and granulations from the posterior cranial fossa.

As concerns the function of the ear the result was also good, the patient, in spite of the extensive destruction and the long continuance of the trouble, being able to hear the watch at a distance of 70 cm and whispering at 2 m.

If we inquire into the nature of the trouble we have been considering, we see that the results of the clinical and the histological examination were different.

As to the histology of the growth I am able to say that both Dr. A. F. Rasmussen and myself examined microscopically the granulations removed during the operation and found them to consist of a vascular, connective tissue thickly infiltrated with small round cells. Dr. R. considered the tumor a small round-celled sarcoma, resembling very much a glioma. A similar diagnosis was made in Berlin from a piece of the extirpated polyp.

Clinically, however, one cannot hold to this diagnosis. First, because a simple and incomplete removal with the sharp spoon could scarcely have brought about the cure of a round-celled sarcoma of such proportions. Then the trouble in the middle ear itself, as well as that in the posterior cranial fossa, was done away with permanently, to judge from the progressive diminution in the hypoglossal paresis, which after nine months had almost completely disappeared. Had it been a round-celled sarcoma, and had there been portions left within the cranial fossa, these would have probably quickly developed and caused an increased pressure upon the hypoglossal and neighboring cranial nerves. Secondly, the slow growth of the tumor speaks against sarcoma. A round-celled sarcoma usually causes, in a few months, an extensive destruction of the temporal bone and death either by bleeding, meningitis, or exhaustion. In this case the destructive process had existed two years and three months before he was made the subject of radical operative treatment.

The tumor might have been syphilitic, tubercular, or due to actinomyces, as the histological basis of these is vascular granulation tissue, but we find no support for these suppositions. The ineffectual use of the iodide of potash speaks against syphilis, and the absence of tubercle formation and of the fungus against tuberculosis and actinomycosis.

The trouble in the temporal bone can much more properly be conceived as a chronic inflammatory process. The commencement of the inflammation dates from the sixth year

of the patient, when his otorrhœa first developed and shortly after apparently ceased. It is very probable, however, that a latent focus of inflammation existed in the region of the antrum during his entire childhood (the hearing was notably bad in right ear, although he cannot remember that he had a running from it). In consequence of the influenza, this inflammation flared up again and caused a slow carious destruction. This attacked the Fallopian canal, producing paralysis of the facial, and, working through the cells, destroyed the posterior wall of the meatus (through which defect the polyp grew), and extended posteriorly into the cranial fossa and pressed upon the hypoglossal.

It is somewhat remarkable that this inflammation was not accompanied by a purulent exudation. I remember, however, having seen several cases where, the drum being imperforate, the caries had broken through the upper posterior wall of the meatus, and yet the exudation was so slight that the auditory canal appeared quite dry. Operation on these cases disclosed cavities in the mastoid filled with granulations and some cholesteatomatous masses, but free from pus.

II.—Chronic right-sided middle-ear suppuration—Pyæmia—Cholesteatoma of the petrous portion of the temporal bone and middle cranial fossa—Mastoid region healthy—Pneumonia—Septic empyæma—Opening of transverse sinus and of pleural cavity—Recovery in six months.

Henrik Vriberg, age five. Admitted by me on June 1, 1890, to the St. Joseph Hospital. Right-sided otorrhœa since earliest childhood. A year and a half ago he was treated in the polyclinic for polypi in right ear. The following, dated March 29, 1890, was entered in the journal: A granulation tumor the size of a pea arises from the upper wall of the auditory canal at the border between the bony and membranous meatus. Kidney-shaped defect in the drum; manubrium mallei hangs free; mucous membrane of promontory smooth. Granulation tumor removed with the snare. During April and May patient stayed away from treatment.

According to the mother, on the night of May 28th he had a severe chill, and during the following days, one or two attacks daily.

June 2d.—Temperature this morning, 37° ; evening, 40.2° . Now and then a chill. Skin dry, burning hot; lips scaling. No sensitiveness or infiltration of the mastoid. No cords perceptible in the neck. Complains at times, but seems fairly free from pain. Vomited this morning after drinking milk. Thirst increased. An excessively fetid discharge from the right meatus, whose walls are somewhat diffusely infiltrated. The floor of the meatus covered with caseous pus. No polypi.

Operation under chloroform. Bone perfectly sound. At the depth of one half *cm* a cavity the size of a walnut, filled with fetid cholesteatomatous masses. These removed with the sharp spoon. The cavity extended upward about one and one half *cm*, reaching above the superior wall of the meatus, and lay partly in the medial cranial fossa, being bounded in part by the dura. After the cavity was opened up as extensively as possible and the cholesteatomatous masses removed with the sharp spoon, it was tamponed with iodoform gauze and a sterile dressing applied.

June 3d.—Temperature, A.M., 36° ; P.M., 36.3° . Slept well after morphine. Pulse 90.

June 5th.—Yesterday noon and during the night severe chills, followed by fever and thirst. Temperature rose during the attacks to 41.1° . Between the attacks patient is quiet, does not complain of pain. During attacks, tosses about the bed, wailing. Temperature this A.M. 36.7° . Dressings changed. Wound looks well. Urine clear, acid, no albumen. Ophthalmoscopic and stethoscopic examinations negative. Ordered 20 centigrammes quinine three times a day.

June 6th.—Yesterday noon two severe chills within an interval of only one half hour. Patient much prostrated, no pain. Temperature 39.2° ; yesterday evening, 40.4° . This morning had another attack. Is perfectly conscious. Sensitiveness to pressure in carotid region, where there are several slightly swollen glands, but no cord can be felt. In order to examine the transverse sinus, a piece of bone the size of a cent was removed from behind the mastoid wound. A large portion of the sinus was laid bare. Its wall, forward near the cholesteatoma cavity, markedly thickened, and hard to the touch, farther backward soft and elastic. No pulsation visible. The wall was opened with a pair of sharp-pointed scissors, but as violent hemorrhage took place, the wound was immediately tamponed with iodoform gauze.

Patient has felt well and has been free from chills until this morning, when he again had an attack.

June 7th.—Yesterday noon another attack. This morning very feeble and collapsed. Rectal temperature only 35.8° . Eats nothing, but drinks considerable milk. Became better during the day, and at the afternoon visit he was sitting up in bed and playing.

June 9th.—Temperature yesterday noon 36.5° ; yesterday evening, 40.7° ; this morning, 36.6° .

June 10th.—Taken with a rather severe moaning cough. Superficial and much accelerated breathing. Lessened resonance and fine crepitant râles over right infrascapular region. Temperature yesterday noon, 40.2° ; last evening, 39.4° , this morning, 36.6° . Yesterday had severe chills. Continuous violent cough. Resonance diminished over nearly entire right side posteriorly. Respiration everywhere accompanied by loud râles. Abundant chlorides in the urine. Pulse 112.

June 13th.—Rapidly weakening. Frequent rigors.

June 15th.—Condition essentially the same. No infiltration in the superior carotid region. No cord-like feel to the vena jugularis.

June 16th.—Bandages changed. Wound granulating and looking well.

June 24th.—Growing weaker. Takes no nourishment with the exception of a little milk during the hot stage. Pulse 130, fairly strong. Auscultation unchanged.

June 26th.—Violent rigors. Complains and moans continually. Is conscious, but very weak.

June 28th.—Absolute dulness on percussion over entire right side of the chest posteriorly. Respiratory sounds weakened. Exploratory puncture made in seventh intercostal space, with discharge of pus. Thereupon exsection of the seventh rib in anterior axillary line. (Dr. S. Saxtorph.) A quantity of frightfully fetid pus removed. Pleural cavity washed with sterilized water, and a drainage tube introduced. Given ether subcutaneously on account of threatened collapse.

June 29th.—Is very weak. Takes a little wine and strawberries. A quantity of bad-smelling pus is discharged through the pleural fistula, filling the room with a terribly offensive odor.

July 9th.—Appetite now quite good. Sleeps better at night.

Suppuration in pleural cavity markedly diminished and no longer fetid. Remains all day in the air on a veranda.

July 18th.—There has developed spontaneously on the right thigh (at the point of an ether injection) a foul undermined ulcer the size of a fifty-cent piece. Nights are restless. During day is fairly well. Now and then chills and thirst.

Not until the middle of August did these elevations of temperature cease.

Aug. 29th.—No fever. Appetite good. Has become stronger. Is up the entire day. Suppuration in mastoid has ceased. There is an opening behind the ear the size of a bean, its edges covered with epidermis. Within the mastoid there is a smooth-walled cavity the size of a nut, lined with epidermis, and connecting deep in with the meatus. No exudation from the middle ear. Pleural fistula is still open and secretes some pus. Bandages changed twice a day.

Jan. 26, 1891.—Pleural fistula closed and patient discharged well.

In *December, 1892*, the fact of a complete cure was authenticated.

Summary.—We have here to do with a case which is unfortunately not rare. A boy is taken in his earliest childhood with a discharge from the ear; this becomes chronic and fetid, but is notwithstanding left to itself. After several years, it occurs to those about him that possibly proper treatment might have some effect on the bad-smelling discharge. The examination discloses extensive destruction in the middle ear, with the formation of polypi. After the patient has been treated for some time, the polypi removed, and the suppuration probably reduced to a minimum and rendered nearly odorless, but before a complete cure has taken place, the treatment is suddenly discontinued. In a year and a half the old condition has returned, the polypi are again removed, and the patient again disappears, until finally the symptoms of critical complications of more general nature arise, the child has chills, accompanied by marked elevation of temperature and general deterioration.

Examination disclosed a fetid discharge from the right meatus, the floor of which was covered with caseous pus.

The mastoid region was perfectly normal, neither redness nor sensitiveness indicated the extensive trouble which, as discovered later, had its seat within.

The complete lack of pain, the clear consciousness and absence of cerebral symptoms, and the sudden elevations and depressions of temperature, all justified the diagnosis of pyæmia, whose origin must be sought for in the purulent breaking down of a thrombus in a vein in or near the middle ear.

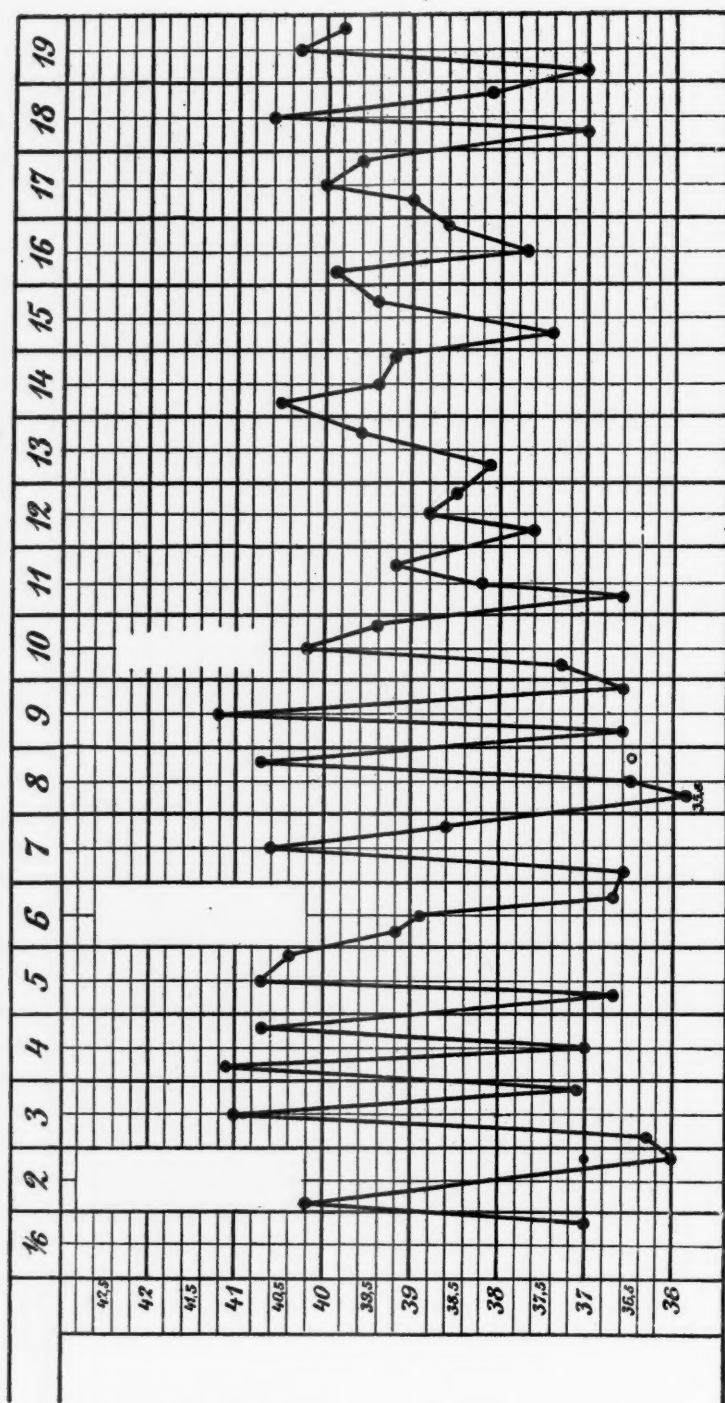
It is apparent that a stagnation of septic exudation somewhere in the middle ear must be the cause of this thrombophlebitis. Therefore the first task of the physician, under such circumstances, is to open up the cavities and provide free drainage. The boy was therefore taken into the hospital and the operation immediately performed.

To our great astonishment, after removing the sound cortical layer, we found a cavity as large as a walnut, situated partly in the middle cranial fossa, and filled with fetid cholesteatomatous masses.

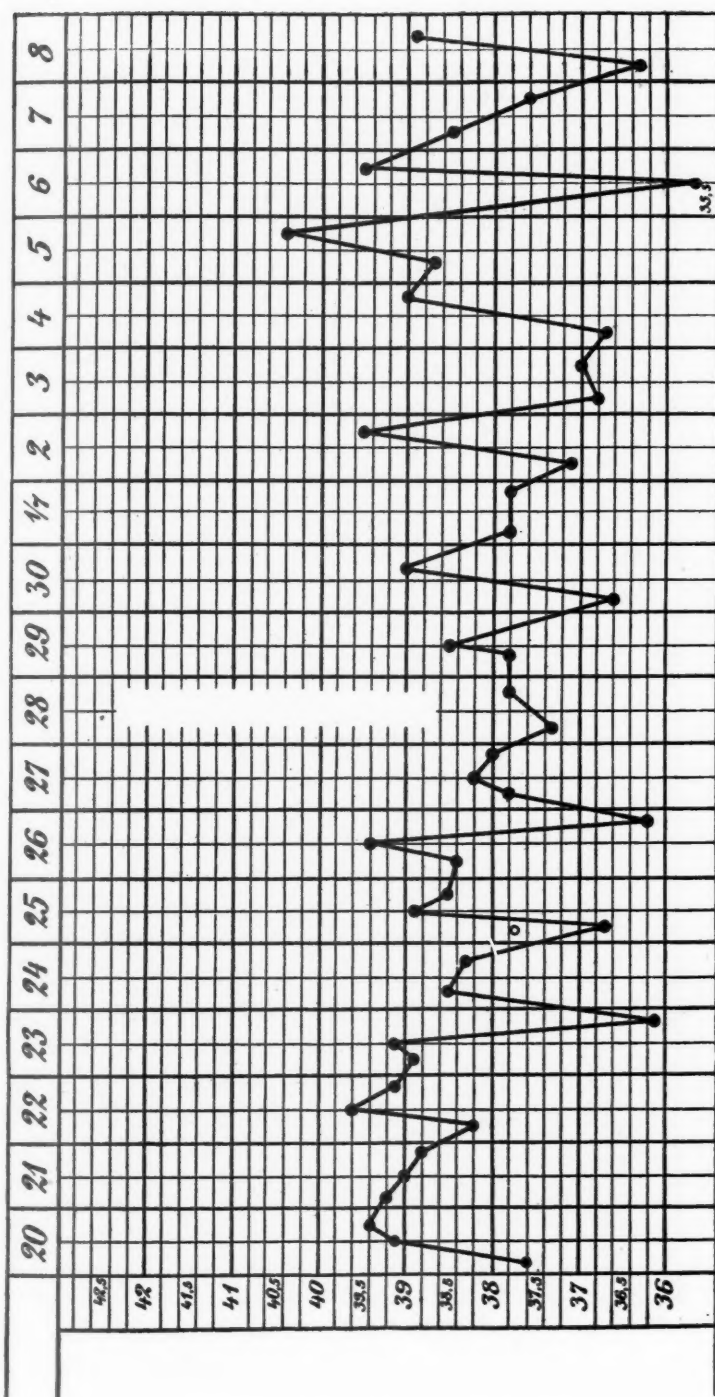
After all the diseased tissue was removed and the cavity tamponed with gauze, I hoped that the danger would be over, especially as the temperature fell immediately after the operation, and on the following evening and morning was still about 36° . This was, however, a vain hope, and the same marked temperature variations manifested themselves as before the operation (see temperature chart). The operation was performed on June 2d; on the morning of June 3d the temperature was 36.3° , at noon 41° , and in the evening 39.1° . June 4th, at noon it was 37° , and in the evening it rose again to 40.7° .

The patient had typical chills followed by fever. Between the attacks the child did not seem much affected. He lay quiet and cheerful and could laugh and play, although he was somewhat tired and did not take much nourishment.

As the disease maintained during the following days this pronounced pyæmic character, I concluded to see if possibly a phlebitis of the transverse sinus might be present. It is true the diagnostic symptoms of this trouble were absent, in that no collateral œdema of the mastoid region existed, and



Temperature Curve (Case II.).



Temperature Curve (Case II.) Continuation.

no thrombi of the internal jugular were to be felt in the neck. Still it was conceivable that the disease was so recent that thrombi had not had time to form in the internal jugular. It was also conceivable that the extensive cholesteatomatous masses in the mastoid had long before destroyed the emissary veins running from the transverse sinus to the outer surface of the cranium, and had thus rendered engorgement in the mastoid region impossible. The negative ophthalmoscopic examination was no sure proof of the non-existence of a sinus thrombosis, as post-mortem examinations have shown that a normal condition of the eye can easily be present in thrombosis of the transverse sinus.

My idea was that, in case there was a phlebitis of the sinus, the only hope of saving the child lay in finding it, removing the septic mass, ligating the jugular vein, and thus avoiding further infection. Therefore, four days after the mastoid operation, the sinus was laid bare and its somewhat thickened wall cut through, but fluid blood poured out in such amount that further operative procedures had to be given up.

The chills continued. Two days after the last operation the temperature was, in the morning, 35.8° , but rose again in the evening to 40.7° . When, on the eighth day, I found signs of a metastatic pneumonia, I looked upon the condition as hopeless. The vital powers rapidly diminished, and the boy emaciated to a skeleton.

Consciousness remained clear. The rigors recurred daily, but the variations in temperature were no longer so marked. The temperature seldom rose to over 39° , and often went down to 36° .

Seventeen days after the beginning of a pneumonia we found signs of an empyæma on the right side. The child was nearly moribund when the abscess was opened, and collapse was only averted by the subcutaneous injections of ether.

From now on the patient improved, slowly however during the first months, six weeks elapsing before he was without fever. The fistula did not close until six months after the operation.

Since this time he has been well, with the exception of being treated for a time for gummous ulceration in the pharynx and naso-pharynx, probably hereditary. The right middle ear, with neighboring parts, is represented by a large cavity lined with epidermis, which communicates with the exterior partly through a large opening in the mastoid, and partly through the meatus.

Contemplating such a case as the above, one naturally asks: How shall we treat a patient, who, during the course of an ear trouble, is suddenly taken with all the symptoms of pyæmia? The answer to this question depends naturally partly on the character of the pyæmia and partly on the nature of the ear disease. The milder forms of pyæmia are often observed during middle-ear suppurations, when the pus does not perforate the drum membrane, but the symptoms generally quickly cease with the discharge of the pus. In a relevant case described by Moos,¹ pyæmia developed in a young man of eighteen. It lasted ten days, and ended without causing metastases in other organs. Here operative treatment was not necessary, as the drum ruptured spontaneously.

In two acute cases observed by Schwartz,² the condition was much more critical. In one case a large abscess formed in the gluteal region, in spite of repeated paracentesis, but no secondary complications on the part of the mastoid followed. In the other case (man of twenty-five) the pyæmia lasted three months, and rendered the opening of the mastoid necessary. It caused a septic retinitis with retinal hemorrhages in both eyes, and an abscess on the left shoulder and upper arm, accompanied by great emaciation. After four and one half months a complete recovery with good hearing took place.

Free incision of the drum, repeated if necessary, and the opening of the antrum are the means at our command for avoiding pyæmic infection in acute cases.

Pyæmic conditions are, however, much oftener met with in the course of chronic otorrhœa.

¹ *Zeitschrift f. Ohrenh.*, xi., 238.

² *Arch. f. Ohrenh.*, xxvii., 288.

The clinical picture is here generally much more critical, and if the patient is left to himself the prognosis is very bad, as death generally results from metastatic infection of other organs.

The pyæmia is either caused by absorption from the middle ear, or is in consequence of septic phlebitis of the sinuses about the ear, especially of phlebitis of the transverse sinus. It is worth while to consider this circumstance particularly. For in case the septic mass is within the middle-ear area, the opening of the cavities of the middle ear will be sufficient to prevent further infection, and in case the organism can master the infectious matter already introduced, a cure can result without further interference.

Pronounced cases of this kind, cured by simply opening the mastoid, and metastatic abscesses when present, are mentioned in the literature of the subject. According to Grunert,¹ during the past year eleven cases of pronounced metastatic pyæmia were treated in Schwartz's clinic by simply opening the mastoid, and of these six, or fifty-five per cent., were cured.

Schmiegelow² and Hessler³ have had similar experiences, each opening up a large epidural abscess. Moos⁴ and Chatellier⁵ have each described a case. There were no evident metastases in the case described by Moos, simply a cough with brownish expectoration; while that of Chatellier was complicated by an abscess of the left arm.

On the other hand, if the pyæmia is derived from a septic thrombus in the transverse sinus, a simple cleaning out of the cavities of the middle ear can have no influence upon the pyæmia. The only possibility of preventing further infection under these circumstances is to attempt to remove the diseased portion of the vein, and to cut off its communication with the rest of the vascular system. Zaufal stated this idea in 1880 and 1884, and proposed for this purpose the ligation of the internal jugular and the opening of

¹ Ref. in *Arch. f. Ohrenheilk.*, xxxiv., 153.

² *Arch. f. Ohrenh.*, xxvi., 92.

³ *Arch. f. Ohrenh.*, xxviii., 19.

⁴ *Zeitschr. f. Ohrenh.*, xxi., 49.

⁵ *Annales des Malad. de l'Oreille*, 1890, 164.

the transverse sinus, which was thereupon to be filled with a disinfectant solution. This proposition was carried out practically by the Englishmen, Lane¹ and Ballance,² and later by Sulzer³ and Parker.⁴ Sulzer simply opened up the sinus and carefully removed the septic mass, while the rule is to first tie the internal jugular. This must be looked upon as a safe means of preventing further infection from the thrombus, though of course it could extend forward into the cavernous sinus and to the other side, rendering infection possible through the other internal jugular.

Lane operated upon three cases. One died and two recovered. In one case there was no thrombosis of the transverse sinus, and on opening it there was such marked hemorrhage that he ligated the internal jugular, after which the patient (a three-year-old child) collapsed, and he had to stop. The child eventually recovered. In the third case Lane ligated the internal jugular but did not open the sinus. Death, however, ensued from the spreading of the thrombus to the petrosal and cavernous sinuses.

Of the four cases operated on by Ballance, two recovered and two died, one from œdema of the glottis caused by a small abscess in the larynx, the other from a metastatic pulmonary trouble which had developed before the operation.

Of Sulzer's two patients, one recovered, after the discharge of fetid pus from the transverse sinus and the opening of an epidural abscess in the middle cranial fossa. The other patient died, in spite of the operation, of septicæmia and patches of lobar pneumonia.

One of the two cases operated upon by Parker recovered, while the other died with symptoms of meningitis. No post-mortem was made.

Finally, Jansen⁵ cured a pyæmia by opening an extradural abscess, and incising a transverse sinus containing pus.

¹ *Brit. Med. Jour.*, May 4, 1889. *Lancet*, Sept. 26, 1891.

² *Lancet*, May, 1890.

³ *Wiener klin. Wochensh.*, 1890, No. 34.

⁴ Ref. in *Arch. f. Ohrenh.*, xxiv., 152, from the *Berliner klin. Wochensh.*, 1892, 214.

⁵ Ref. in *Arch. f. Ohrenh.*, xxxiii., 298.

According to Jansen, in addition to the above, three incisions into the transverse sinus, with fatal results, were made during 1890-92 at the Berlin University clinic.

We have therefore fourteen cases of sinus trouble treated operatively, with the result that seven recovered and seven died. The causes of death were either endocranial complications, such as cerebral abscess, meningitis, extension of the thrombosis, or metastatic troubles in the peripheral organs, especially in the lungs.

These results necessitate the direction of our attention, in all cases of critical metastatic pyæmia, to the possibility of a septic sinus phlebitis. Consequently we dare not content ourselves with the simple opening of the antrum or attic, but must lay bare the sinus and, if necessary, open it and remove the septic thrombus, ligating at the same time the internal jugular. If an open sinus is found, as was in my case, I consider it incorrect to ligate notwithstanding the internal jugular, as Lane did in one of his cases. Such an operative procedure would be justified only if evident signs of a phlebitis of the internal jugular were present (a hard sensitive cord occupying the position of the vein in the carotid region).

In case metastases take place in the lungs, the general idea has been that the patient is certainly lost, and that one should abstain from useless operative interference.

Reinhard and Ludewig¹ express themselves as follows:

"We believe that so long as no positive signs of metastases in the lungs are demonstrable, it is permissible and obligatory to proceed operatively. As soon, however, as these exist, as shown by cough with bloody expectoration, shortness of breath, etc., we will refuse to perform a useless operation, for it is then no longer possible to save the life of the patient."¹

The fact that recovery took place in my case, in spite of all the signs of a pneumonia, and in spite of the enormous accumulation of pus in the pleural cavity, would seem to indicate that even under these circumstances one should try operative treatment, although this case, as far as the

¹ *Arch. f. Ohrenh.*, xxvii., 217.

favorable result is concerned, must be considered exceptional.

Appendix.—Although it has been impossible for me to follow the history of the following case, nevertheless I think a case of sarcoma of the mastoid process possesses sufficient interest to be published notwithstanding this fact. For us the case is of especial interest, since the sarcoma brought about a paresis of the facial and hypoglossal, together with hemiatrophy of the tongue, so that the case had, in this connection, great similarity with the first one described above. I express my most hearty thanks to Dr. Ammentorp for his permission to publish the case.

III.—Sarcoma of mastoid process—Operation—Improvement—Later history unknown.

Christianna P., eight years old. Admitted March 22, 1880. Discharged April 27, 1880.

History.—Healthy parentage; none of her near relatives have tuberculosis or tumor formations of any kind. Has had measles and pertussis; otherwise has always been healthy. During past summer had trouble in eating, in that the cheeks would get in between the teeth. In the fall a tumor behind the ear was observed, coming on after a bruise by a stone. This gradually increased in size, unaccompanied by pain or signs of inflammation. Fourteen days ago a physician incised the apex of the tumor, and let out some blood. Later there was a discharge partly of blood, and partly of a yellowish tenacious fluid. Eight days ago a slight bloody discharge from the left ear appeared. On pressure about the meatus, the pain radiates out over that side, and over the back of the head.

Child well-developed and nourished, skin normal. Behind the left ear a tumor 17 cm from before backward, and 13 cm in height. Its posterior edge reaches 2 or 3 cm beyond the middle line, forward it extends to the border of the basis maxillæ, over which it arches somewhat. The auricle is pushed upward and forward so that the auricle stands nearly perpendicular to the medial plane. Downward, the tumor reaches with its most anterior portion to nearly the level of the basis maxillæ infer., and rises in an oblique direction upward and backward toward the external occipital

protuberance. The tumor is egg-shaped, markedly arched, and comes somewhat to a point about 4 *cm* behind the ear. The skin, normal to the touch, is stretched and very red; several subcutaneous veins visible. Over the extensive central portion the tumor is tense and fluctuating; at the borders, hard as bone, this hardness passing gradually into that of the os occipitis.

Strong pressure at some places elicits a feeling like that of crackling parchment. Very little sensitiveness; meatus is much compressed, its posterior wall has a perceptibly cartilaginous surface. Probing causes the discharge of some serous fluid. Hearing in the left ear is entirely gone. Neither from the mouth nor pharynx can a tumor be felt. The muscles of expression are paralyzed, the mouth drawn to the right, and there are other evidences of a marked facial paralysis. The left half of the tongue is atrophic. Taste absent on left side. Voice clear; deglutition normal. No swollen glands in the neck. Upper end of sterno-cleido-mastoid muscle appears to be stretched out over the surface of the tumor. In all other respects the patient's condition is perfectly normal. Pulse 120.

March 25th.—By means of a crucial incision, four flaps were formed. The sterno-cleido-mastoid and the fascia between this and the trapezius, as well as this latter muscle, were stretched out over the tumor. The tumor was laid bare down to the cranium, and its tension relieved by incision. It was cystic, degenerated, the cavities containing blood. The walls of the cavities consisted of periosteum and bone. Since the meninges of the cerebellum could be felt through a defect in the skull 3 *cm* long and 1½ *cm* wide, and the bare bone near the occipital condyle could also be reached through the cystic cavity, the walls of the same were cut loose above and behind. Part of the tumor in the retro-maxillary fossa was removed so that the ear went back into place. Some soft masses of the tumor were left near the ramus of the lower jaw. Only a few arteries were ligated. The cavity was tamponed with carbolyzed gauze and the flaps partly sutured together.

In the journal was further noted: The wound did well; there were slight elevations of temperature in the evenings, except during the first fourteen days.

April 14th.—Patient felt well; no fever; got up.

April 24th.—Cicatrization progresses nicely. Edges of the wound clean. No signs of recurrence.

April 27th.—Patient was discharged and travelled home.

Microscopical Examination.—The tumor is very vascular, and contains several cysts, varying in size and communicating with each other. The walls between these cysts contain isolated bone lamellæ and ridges of bone. Some portions of the tumor consist of connective tissue, with a few nuclei; other portions typify a small round-celled sarcoma.

ON SYSTEMATIC PROCEDURE IN OPERATIONS
FOR THE RELIEF OF INTERCRANIAL DIS-
EASE SECONDARY TO EAR SUPPURATION.

By URBAN PRITCHARD, LONDON.

NEITHER in respect to the conditions for which the operations were undertaken, nor as to the results, is any particular novelty claimed for the following cases. They are, however, not unworthy of record as illustrating what I believe to be the correct method of procedure in *every* case in which surgical operation is undertaken for the relief of intercranial disease secondary to ear suppuration, viz.:

1. First thoroughly open the antrum, and explore the mastoid cells.
2. Failing to find sufficient evidence to account for the whole of the symptoms, the wound in the skull should be enlarged backwards so as to expose the middle and posterior fossæ above and below the lateral sinus, which should be explored by means of a hypodermic syringe. At the same time subdural abscesses may be carefully looked for.
3. If a clot be found in the sinus, the internal jugular vein should now be tied, and the sinus opened and thoroughly cleared of its contents.
4. If there is any suspicion of cerebral or cerebellar abscess, exploratory punctures may be made above and below the sinus, and the pus, if found, evacuated.

CASE I (from the *Lancet* of March 4, 1893).—A girl, aged thirteen, was admitted into King's College Hospital on November

5, 1892, with a history of having suffered from purulent discharge from the ears for some years. Eight days before admission ear-ache and headache on the left side were complained of, together with pain on movement in the upper part of the neck on the same side. These pains gradually became very severe; vomiting was an early symptom; rigors developed, some two or three a day, and twitchings of the right leg were said to have been noted during sleep. On admission the patient was seen to be a well developed girl, very restless, but answering questions quite rationally. She complained of intense pain in the ear and in the side of the head, posterior to the ear, the pain extending down the neck. On examination the right ear appeared to be quite normal; the condition of the left ear was as follows: On mere inspection nothing appeared abnormal. Within an area of two inches and a half posteriorly to the pinna gentle percussion with the finger gave rise to pain, but not of an intense character. Pain of a more severe type was caused by digital examination of the upper part of the neck, which was then seen to be slightly swollen, but no fluctuation could be detected. The membrana tympani was dry, and the vessels accompanying the handle of the malleus were congested; there was no marked bulging. The watch was heard at a fairly normal distance on the right side, and at $\frac{6}{100}$ in. on the left. There was no optic neuritis. The urine had a specific gravity of 1009, and did not contain any albumen. Every other organ and viscus appeared to be quite normal. The temperature at 1.30, P.M., was 102° ; pulse 116; respiration 44.

As the pain and temperature remained the same, it was decided to operate at 6.00, P.M., on November the 6th upon the following lines: (1) To chisel into the mastoid antrum; (2) if necessary, to open up the mastoid cells; (3) if nothing deemed sufficient to account for the symptoms could then be found, to chisel backwards and open up the lateral sinus. The patient was anæsthetized, the hair cut, the left side of the head shaved and purified by scrubbing with a nail-brush, soap, and a carbolic solution (1 in 20). The left external auditory meatus was syringed out with a carbolic solution of the same strength. A curved incision, two inches long, was made a quarter of an inch behind the pinna of the left ear, the periosteum detached, and the mastoid antrum opened by means of the chisel and mallet. On the first introduction of the chisel into the antrum gas bubbled out with the blood. The opening thus made was enlarged, during which pro-

cess a few streaks of thick pus came away, but there was no distinct evacuation of any collection. Scraping with a sharp spoon only removed old cheesy degeneration without offensive odor, and it was thought that so far the cause of the severe symptoms had not been revealed; it was, therefore, determined, to examine the lateral sinus. An incision was accordingly made backwards from and at right angles to the preliminary cut. The opening in the skull was enlarged upwards, backwards, and downwards. More cheesy matter was scraped away, and as the dura mater, covering the temporo-sphenoidal lobe, bulged considerably into the upper part of the aperture, this membrane was opened, and a carefully purified exploratory needle was passed into the brain substance in search of pus, but with no result; the incision into the dura mater was accordingly reunited with a fine catgut suture. After a little more chiselling the lateral sinus was completely exposed. Into it the purified needle of a hypodermic syringe was inserted, but no blood or pus could be drawn up, and on withdrawing the needle it was found to have a very offensive odor. The outer wall of the sinus was next thoroughly opened by a longitudinal incision, and, on scraping out the contents, fetid gas bubbled up. A probe was then thrust upwards towards the torcular Herophili, and downwards towards the internal jugular vein, but no blood could be made to flow, and on withdrawal the probe had a most offensive odor. The next step was the ligation of the internal jugular vein, and an incision was made from the angle of the jaw to the cricoid cartilage, but, on account of the matting together of the enlarged and inflamed glands, this incision had subsequently to be enlarged. The vein, when exposed, appeared to be collapsed; it was tied in two places, and divided between the ligatures. The operation had already lasted two hours and a half, so it was thought desirable to finish as quickly as possible. The lateral sinus was again scraped with a sharp spoon, and syringed out with a solution of perchloride of mercury (1 in 3000), in the hope that by these means the original source of infection would be removed. The temperature at midnight was 97.4° ; pulse 140; respiration 44.

Nov. 7th.—The pain has subsided; there has been no vomiting or rigors. She takes nourishment well, and feels much better. Urticaria over the chest and the arms was noticed this morning. The temperature during the day remained slightly under the

normal. The pulse fell from 136 at 4 A.M. to 96 at 10 P.M., and the respiration from 40 to 32 respectively.

8th.—At 6 A.M. the temperature was 102.2° , and at 10 P.M. 101.6° . Except for the temperature, the condition continued much the same as yesterday.

9th.—The temperature at 10 A.M. was 101° , at 2 P.M. 103.4° , and at 4 P.M. 103.6° . At 4 P.M. Dr. Pritchard decided that as the temperature was gradually rising the internal jugular vein should be dissected out and the opening in the skull enlarged. The patient was again anæsthetized, and as Mr. Cheatle had performed the preliminary operation Dr. Pritchard requested him to undertake the second. The horizontal incision above described was prolonged a little backwards, and the opening in the skull was enlarged, particularly in a backward and downward direction, where the dura mater had become separated from the skull, and where, too, a dependent position for drainage could be best obtained, and the burrowing of inflammatory material towards the cerebellum prevented. (During the performance of this part of the operation the facial nerve must have been injured, notwithstanding the care taken to avoid this accident.) The lateral sinus thus further exposed was laid open, the clotted offensive contents scraped out with a sharp spoon, and the outer wall entirely removed, so that the sinus was practically obliterated. The upper end of the sinus was allowed to bleed for a few seconds in order to clear away as much as possible the remaining offensive clots; hemorrhage was easily controlled by light pressure. The wound in the neck was then reopened and the internal jugular vein dissected out as far as possible in the direction of the skull. A solution of perchloride of mercury (1 in 2000) was syringed from the remains of the sinus through the remnant of the internal jugular vein into the wound in the neck; much offensive clot came away during this process. The wound in the neck was sutured and the whole dressed with cyanide gauze. At 7 15 P.M. the temperature was 97° , at 10 P.M. it had risen to 99° . The patient slept during the night.

10th.—The temperature at 6 A.M. was 100° , at 10 P.M. 99° .

11th.—The temperature at 6 P.M. was 98.6° . The wound, which had been dressed daily, looked healthy. The patient suffered no pain and looked and felt quite well. This continued until noon of Nov. 12th, when the child had a rigor, with a temperature rising to 104.2° . This was found to be due to a

collection of discharge in the resutured cervical wound; the stitches were accordingly cut and the wound opened up. On the afternoon of the following day the temperature reached 103° , from which point it steadily declined, and by Nov. 20th it became normal and did not subsequently rise. The long wound healed from the bottom, there were no further bad symptoms, and the patient was sent to a convalescent home on January 27, 1893.

Remarks on CASE 1.—In this case it remained a matter of doubt whether the general septic infection was from the clot in the posterior part of the lateral sinus, close to the torcular Herophili, or to that in the jugular vein. I could not help thinking that it was due to the former, for the vein was occluded in the first operation. A point of surgical interest was the ease with which slight pressure arrested the flow of blood from the sinus after the scraping. But by far the most important point was the power of surgical interference in saving the life of the patient, even although the septic disease had so far advanced that the thrombus in the sinus had broken down, and there were fetid gases in the vein; no doubt the excellent general health of the patient was an important factor in the result.

CASE 2.—T. C., a male, aged twenty-six, was admitted into King's College Hospital on February 14, 1893, with the history of discharge from his ears for nine or ten years, but prior to the present illness there has not been any pain. On the morning of Feb. 11th, after a heavy drinking bout, he complained of severe pain in the frontal region, and vomited once or twice during the night. On the 12th, he complained of giddiness, was more or less delirious, and is said to have had three "fits" in the course of the morning; in the afternoon he was seen by a doctor, who found him drowsy, but answering questions quite sensibly, and complaining of pain in the region of the right ear; there was no œdema over the mastoid, the tongue was furred, the bowels constipated, temperature 104° . Ordered a purgative and lotio acidi boracis for syringing out the ear.

On the 14th, before admission, had three definite rigors, the temperature rising to over 104° on each occasion, and he complained a good deal of spasmodic abdominal pain.

On admission was found to be a healthy, well nourished man. Was in a restless, dazed condition, quite unable to give a coherent account of himself; complaining of pain in the head and around his right ear, and especially of intense and persistent abdominal pain, which became worse at times. Tongue furred; lungs, heart, and urine normal; no optic neuritis; nothing to be made out in the abdomen except that the pain was relieved by pressure. Temperature 99.4°.

The pinna of the right ear was normal in position and appearance; there was no redness, swelling, pain or tenderness over the mastoid; the external meatus was blocked with pus and cerumen, removal of which revealed a polypus growing from the upper and posterior part of the meatus, deep down. The left ear showed signs of old suppuration, but nothing acute. The polypus was removed by torsion and its base curetted, and the meatus syringed out with a solution of carbolic acid 1:40.

Feb. 15th.—General condition about the same; abdominal pain still continues; temperature normal.

Feb. 16th.—Morning temperature 99.2°. Evening 100°.

Feb. 17th.—Temperature at 8.45 A.M. 101°, at 10.15 A.M. 103°; fell to normal at 4 P.M. General condition remains the same.

Feb. 18th.—At 3 P.M. the temperature again arose to 103°; at 11 P.M. as the patient appeared worse an operation was decided upon.

The patient having been anæsthetized and a sufficiently large surface of the right side of the head having been shaved and purified, a vertical incision was made close behind the auricle, and the bone being bared the mastoid process was carefully chiselled away in the direction of the antrum. The bone was found to be sclerosed throughout, and a depth of about an inch was reached without coming upon the antral cavity, and a little deeper and the cranium was opened. It was determined to open the cranium freely and explore the lateral sinus before proceeding farther in search of the antrum. The original incision was converted into a T-shaped one by means of a horizontal cut extending backwards and a large surface of the skull was thus exposed. The opening in the cranium was enlarged in the same direction by means of the chisel, and the lateral sinus freely exposed; in the course of this proceeding, a *small extra-dural abscess was opened up*, containing about a drachm of very fetid pus. This abscess was situated in the groove of the lateral sinus, and the bone in its immediate neighborhood was roughened.

The sinus was obviously filled with fluid blood, as the effect of respiration upon it was very marked; however, to make certain, the purified needle of a hypodermic syringe was introduced into it, and a small quantity of healthy blood, free from offensive odor, was withdrawn. Another purified needle was then introduced horizontally into the substance of the cerebrum, but no signs of pus were discovered. Chiselling forward and inwards at the site of the original skull opening was now resumed, and at a depth of $1\frac{1}{4}$ inches from the outer surface of the mastoid process the antrum was reached and was freely syringed out. The wound was dressed with iodoform and filled with cyanide gauze. The operation lasted three hours, the first part was performed by myself, the latter part by Mr. Lenthal Cheatele.

For the two following days the temperature remained normal; all pain in the head ceased and that in the abdomen decreased; there was so little shock or discomfort that the patient urgently requested to be allowed to become an out-patient.

Feb. 21st.—Temperature rose to 99.4° .

Feb. 26th.—Granulations were seen growing from the site of the old polypus.

March 1st.—The granulations having increased so as to obstruct the free passage between the wound and the external meatus, the patient was again anæsthetized, the polypoid growth thoroughly removed, and the antrum, tympanum, and meatus converted into one cavity by chiselling away the upper part of the posterior wall of the meatus. After this the patient made an uninterrupted recovery, and was made an out-patient. There is still some discharge from the enlarged tympanic cavity, but this is steadily but slowly diminishing.

Remarks on CASE 2.—In its general aspect, this is a contrast to the former case, inasmuch as the intracranial mischief was in its earliest stage, while in Case 1 it was in its latest. The first point of interest was the reflex abdominal pains, which were so marked as to delay the operation lest something beyond the meningitis should develop. As regards the operation itself the depth at which the antrum was situated, $1\frac{1}{4}$ inches, was a serious complication, as it rendered the operation so tedious. The great relief from pain was only to be expected, but the absence of shock after three hours' chiselling was remarkable.

CASE 3.—J. T., a boy aged five years; admitted into King's College Hospital on June 12, 1893, with a history of otorrhœa in infancy, but no discharge from the ear from that time to the present attack a week ago. On June 2d, without assignable cause, complained of pain in the right ear; this was quickly followed by discharge from the ear, vomiting, and great thirst, and these symptoms have gradually intensified. On admission was seen to be a delicate-looking boy complaining chiefly of pain on the right side of the head; he was restless and answered questions vaguely. Temperature 105° , pulse 100, respiration 44. A trace of albumen in the urine. On examination the left ear was found to be normal. The right ear was in the following condition, viz.: Pinna normal; meatus blocked with pus; intense tenderness over the mastoid region. No optic neuritis. The history of the attack, the high temperature, and the intense tenderness were held to indicate the necessity of immediate operation, which was performed by Mr. Lenthal Cheatele.

The same method was adopted as in the two former cases. The mastoid cells were spongy and full of pus, and on opening into them, nearly a teaspoonful of thick offensive pus sprang out, and from the condition of the adjacent parts it was apparent that this collection must have lain between the upper part of the lateral sinus and the dura mater. Exploration of the lateral sinus yielded only negative results. The dura mater over the temporo-sphenoidal lobe bulged forward in a suspicious manner, an exploring needle was therefore passed into the centre of the bulging membrane and offensive pus found. The dura mater was then opened by a vertical incision and the pus from an abscess about the size of a walnut was evacuated, and a great deal of highly offensive and necrosed tissue was removed by means of a sharp spoon. A drainage tube was inserted, the parts covered with purified iodoform, and the whole was dressed with cyanide gauze. After the operation the temperature fell to 98° .

On dressing the wound on the following day the ulcerated surface of the lateral sinus came away on the dressing; the loss of blood, however, was but slight as the hemorrhage was easily controlled, temporarily by the index finger, and permanently with a plug of cyanide gauze. Temperature normal; less delirium; better in every way.

June 14th.—Temperature 104° . General condition much the

same as before the operation. Exploration of the lateral sinus drew off only normal blood.

June 15th.—There was considerable hernia cerebri. The drainage tube had been pushed out, and the little finger inserted into the aperture in the dura mater entered a cavity that had obviously increased in size since the operation. Gentle pressure was applied over the hernia and the parts dressed as before.

June 17th.—Very delirious, noisy, and incoherent; complexion gray, conjunctivæ yellow, bile in the urine. General condition suggestive of infection from the wound.

A needle introduced into the sinus again only yielded normal blood, nevertheless it was resolved to tie the internal jugular vein, and this was accordingly done, at a spot just above the level of the cricoid cartilage. In the evening there was a marked improvement in the condition; temperature normal, quieter, taking food.

June 18th.—Improvement maintained, temperature still down.

On the evening of June 19th the temperature rose to 101° , but without exacerbation or renewal of the other symptoms of distress; these latter, however, gradually appeared, the temperature rose higher and higher, and the boy eventually died on June 29th, with all the old symptoms of exhaustion. Unfortunately no post-mortem could be obtained.

Remarks.—In this case the disease was very acute and apparently every extensive. The rupture of the weakened wall of the lateral sinus and the facility with which the hemorrhage could be controlled by pressure so slight as not finally to obliterate the vessel, was a point of practical interest. The marked, though temporary, improvement in the general condition which followed the ligature of the internal jugular vein is worthy of note.

It is somewhat remarkable that in none of the cases here recorded were there any signs of optic neuritis, showing, I think, that a very serious condition may exist without this important sign being present.

Referring now in detail to the several steps in the method of operating which the above cases serve to illustrate:

1. In the majority of cases recorded, at least in those recently published, no reference is made to the ex-

ploration of the mastoid cells and the opening of the antrum. I think myself, however, that this is a point of prime importance and should always be insisted upon. If neglected, the surgeon is apt to leave untouched the very origin of all the mischief, and if this does not prove fatal to the immediate success of the case, there is always the danger of subsequent reinfection.

2. In enlarging the wound of the skull I prefer to use the chisel and mallet; Hoffman's gouge forceps are also of great assistance; if the trephine be employed care should be taken that the trephine opening should be made continuous with the antral opening so that the intermediate point should not be missed. The great point, however, in this step of the operation is to expose the lateral sinus and the dura-mater immediately above and below it, as by this means we obtain access to both the middle and posterior fossæ of the skull, and can thus explore both the cerebrum and cerebellum if necessary. In the course of this proceeding, careful search should be made for collections of pus between the dura-mater and the bone, and if any extensive extra-dural abscess be found, the cranial opening must be enlarged.
3. In the event of a thrombus being found in the sinus, the spot chosen for tying the internal jugular vein should be one well below any clot that may be felt in the vein itself, and it may be advisable to dissect out a length of the vein. The sinus should be freely opened and the contents thoroughly removed by means of the syringe, sharp spoon, etc., free bleeding from the upper end of the sinus being encouraged; this bleeding can readily be checked by plugging, when once we are assured that the contents of the sinus have been evacuated.

In many, if not in all cases, in which a cerebral abscess has resulted from middle-ear disease, the formation of such an abscess has been preceded by a certain definite chain of pathological events, such as subdural abscess, clotting of the

sinus, etc. If, then, the surgeon does not proceed in the systematic and methodical manner suggested above, but prefers to trephine at once over the seat of the supposed cerebral mischief, there is every probability that one of the links of the chain may be overlooked. The primary source of infection still remaining uncorrected, not only is the success of the operation rendered extremely doubtful, but the patient, even if he recovers is always liable to similar attacks, any one of which may eventually prove fatal.

Finally, it should never be forgotten that even if nothing is found to account for the grave symptoms, the operation itself, involving as it does removal of bone and considerable local depletion, will in a fair proportion of cases arrest the symptoms, the patient making a good recovery.

In preparing the notes of these cases for publication, and more particularly in the treatment of the cases themselves, I have had the advantage of the assistance of Mr. G. Lenthal Cheatle, F.R.C.S., assistant surgeon to King's College Hospital. In the first and third cases, Mr. Cheatle himself performed the operations, in the second case we both took a share of the work.

SOME REMARKS ON THE ANATOMICAL POINTS CONCERNED IN THE STACKE OPERATION.

By SAMUEL ELLSWORTH ALLEN, M.D., CINCINNATI.

I AM prompted to make the following statements by the perusal of an article which appeared in the last issue of these ARCHIVES (vol. xxii., No. 4), entitled "The Stacke Operation for Caries Involving the Middle Ear," etc. It is impossible for any one acquainted with the author's skill and ability, to criticise him as an operator. From an anatomical standpoint, however, his article is vulnerable. I can the better criticise his anatomical conclusions because I fell into the same error when preparing specimens for my monograph on the mastoid operation. I made a great many of what I considered horizontal sections of the temporal bone. That is, I took the disarticulated bone and, holding it upright in a vise, cut sections horizontal to this position. Such sections are shown in Politzer's *Zergliederung des Gehörorgans*, pp. 47 and 48, and in other anatomical works. As the bone is situated in the skull, however, such sections are far from horizontal. Similar points of the auditory canals on each side are in the same horizontal plane, and all planes passing through the temporal bone to be horizontal must be parallel to this plane. Operations are performed upon the bone *in the skull*, and to the operator *downward* and *upward* mean perpendicular to this plane, and not to a horizontal plane arbitrarily established upon the disarticulated bone. The *topographical* anatomy of the bone should be studied on truly horizontal and vertical sections. The horizontal plane, established by Dr. Holmes on the section represented in

Fig. 5 (see Dr. Holmes's article), is not horizontal at all, but runs inward and *upward*. A horizontal plane, started 2 mm above the centre of the external auditory canal, would pass below the cochlea and internal auditory canal, as may be seen from the figure in the ninth edition of Quain's *Anatomy*, page 430, where the bone is represented in its natural position. I am satisfied that truly horizontal and vertical sections, passing just over and just behind the meatus, are the best adapted to display the surgical anatomy of the bone. These are particularly fit because the horizontal section opens up the horizontal semicircular canal and the vertical one the facial canal. (Such sections are shown in Plates II. and III. of my monograph.) I make these statements regarding the true horizontal plane because I have criticised Stacke where he says that a certain cleft, about which I shall speak more fully, cannot be widened downward, and because Dr. Holmes takes exception to this criticism. *Downward* on a true horizontal section is a very different direction from *downward* on a section running inward and *upward*. Downward is vertical to a horizontal plane, if this plane is made to tilt inward and upward; then downward becomes downward and *inward*. To one looking at such sections as are represented in Fig. 5 (Dr. Holmes's article), a *true* vertical direction would be represented, not by a line perpendicular to the plane of the section, but by one passing upward and *inward*. False horizontal planes give us a wrong idea of the relative positions of the various parts. Take this same Fig. 5, facial canal, represented by *x*. Here the facial canal is seen to be in the posterior wall of the meatus. When it is said that bone can be removed *downward* from a point on the innermost portion of the upper edge of this posterior wall, the conclusion is inevitable that this can only be done by opening up the facial canal as we descend. Looking at the section and imagining the vertical course of the facial canal, we make this course perpendicular to the false horizontal plane, and therefore conceive its uppermost portion to be much farther outward than it really is. The facial canal at the top of its vertical course is *under* the forward and outward portion of the curve of the horizontal semicir-

cular canal, and *medial* to the convexity of this curve. It is therefore in the petrous portion of the bone and not in the posterior wall of the meatus. As it ascends from the stylo-mastoid foramen it leaves more and more the region of the posterior wall. Low down, it is posterior and lateral to the tympanic cavity, varying in its proximity to the posterior wall; high up, it is entirely within (medial to) the medial wall of the cavity of the neck of the antrum. The facial canal is here *vertical*; it cannot be, therefore, in any part of this portion, nearer the surface (farther lateral) than a perpendicular plane passed tangent to the tuberosity of the horizontal semicircular canal. True horizontal sections show that the horizontal semicircular canal (external portion of the curve) is farther outward than the facial canal. A perpendicular plane let fall tangent to the tuberosity formed by the semicircular canal would strike the plane of Dr. Holmes's Fig. 5, external to x . This same Fig. 5 is a very schematic representation, because the relative positions of the horizontal semicircular and the facial canal do not admit of the former being opened longitudinally and the latter transversely, by a common sectional plane, as is here shown.

For the surgeon there are practically three cavities connected with the tympanum. Considerable confusion arises in descriptions of these parts owing to the fact that anatomists have given us but two names for these three cavities. There is the attic, correctly described by Dr. Holmes as "the space located above the tympanum, within which are contained the body and short process of the anvil and the head and neck of the hammer. The floor of this cavity is about indicated by the course of the chorda tympani nerve." Then we have the antrum, and between these two there is this third cavity, which I have called the neck of the antrum. Stacke in his writings speaks of it as the *aditus ad antrum*, a very good name, but one which has, unfortunately, been applied by some (Bezold) to the attic proper.

In Dr. Holmes's article a passage from Stacke is translated thus: "Deep in, however, there still remains below a ridge between canal and antrum; and on a level with the aditus

the width of the cleft is regulated by this ridge of bone. Should we *at this point* attempt to *widen the attic downward*, injury of the facial would be unavoidable." As can be readily seen from a perusal of his original article (*Berl. klin. Wochensch.*, Jan. 25, 1891) Stacke recognizes three cavities, the attic, the aditus, and the antrum. In this passage the word *attic* does not appear at all. What Stacke really says is: "Should we at this point attempt to widen the *aditus* [not attic] downward," etc. The same word is used by Stacke here as is used earlier in the passage when he says: "And on a level with the *aditus* the width," etc.

Dr. Holmes translates this word (*aditus*) correctly in the first part of the passage, and deliberately changes it into *attic* in the latter part, and emphasizes the mistake by putting the word in italics. He credits Stacke with an absurd remark according to his own definition of attic. If the attic is *above* the tympanum and its floor is represented by the course of the chorda tympani nerve, where is there anything to widen downward? There is no floor to the attic except a small portion of the superior wall of the meatus, over which the upper part of the attic extends. That Stacke does not use the words *aditus* and *atticus* synonymously is clearly evident from his article.

What are the boundaries of this *aditus*, this neck of the antrum, which Stacke says it is so dangerous to attempt to widen downward? Above it is bounded by the tegmen tympani, medially by the tuberosity of bone formed by the horizontal semicircular canal, and above this by cancellated bone, laterally by the inner edge of what we may call the upper-back wall of the meatus. The floor of the *aditus* is formed by cancellated bone. The upper portion of the narrow posterior wall of the tympanum bends sharply backward (backward and outward) and becomes the floor of the *aditus* (neck of the antrum), and continuing downward and backward passes into the floor of the antrum.

Supposing we have made the ordinary Schwartz opening into the antrum, and then wish to practise the Schwartz-Stacke modification. To do this we have now to cut away the wedge-shaped bridge of bone which remains

between the meatus and the antrum—artificial canal. Dr. Holmes says: "We now begin to cut away the wedge, exerting great precaution when removing the last portion, which forms part of the outer wall and floor of the attic." The innermost portion, the apex of this wedge of bone, is the outer wall of the aditus (neck of the antrum), and not the "outer wall and floor of the attic." In taking away the wedge we do remove a portion of the superior wall of the meatus, and inasmuch as we do this do we take away the outer and small lower wall of the attic. That this is not what Dr. Holmes means by "outer wall and floor of the attic" is evident from the fact that later on he speaks of the removal of the superior wall as a separate step.

After removing this wedge, which we have done by having the upper line of cut pass directly inwards and the lower line inwards and upwards, there is a ridge of bone formed by what is left of the posterior wall of the meatus. This ridge, as Dr. Holmes says, increases in height as it approaches the middle ear. At its innermost portion it passes into the floor of the neck of the antrum (aditus, Stacke). According to Stacke: "So much of the posterior wall can be removed laterally that the lower wall of the external canal can pass uninterruptedly into the lower wall of the antrum." (In Dr. Holmes's translation antrum is printed attic.)

"Deep in, however, there remains a ridge of bone between canal and antrum." This ridge is of course formed by what has been left standing of the posterior wall of the meatus. At the level of the aditus, this ridge passes into the floor of that cavity. Stacke then goes on to say: "Should we at this point (at the floor of the *aditus*) attempt to widen the *aditus* (not attic, as Dr. Holmes translates it) downward, injury of the facial would be unavoidable." (Parts in parentheses are mine.) The facial canal lies farther inward than the horizontal semicircular canal, the tuberosity of which forms the *inner* wall of the neck of the antrum (aditus). How, then, can lowering the floor of the *aditus* hurt the nerve?

Lowering the floor of the aditus and with it the innermost

portion of the ridge, widens the communication between meatus and antrum *deep in*, and gives much freer access to those cells which lie over the semicircular canal and in the medial wall of the antrum, and is therefore of great benefit in the after-treatment. In cutting the ridge *directly downward* we do not touch the lower portion of the posterior wall of the meatus *deep in*; such a vertical line falls outside or lateral to this portion, and does not, therefore, come near the facial nerve. The erroneous idea that such a removal of bone endangers the facial canal probably arises from the study of sections which are not horizontal, and hence it has been impossible to realize how far outward the semicircular canal is. Here is what Dr. Holmes says about removing this ridge: "We can with safety obliterate this ridge up to within 10 *mm* of the annulus tympanicus, measured along the lower and posterior portion of canal; beyond this part (medialwards) we encounter a dense, rounded ridge of bone curving forward over the oval window, and forming a part of the floor of the attic. This ridge, throughout its course, encloses the facial nerve, and within the part curving over the window is also harbored the horizontal semicircular canal, which must, of course, not be injured." This passage is exceedingly inaccurate and loosely worded. The word ridge occurs twice, the first "ridge" means the portion of the posterior wall of meatus left standing after removing the wedge; the second "ridge" refers to the tuberosity formed by the horizontal semicircular canal, which is erroneously said to contain the facial nerve and to curve forward *over* the round window. In what follows, including his translation of Stacke and his criticism of my compilation, Dr. Holmes seems to have confused these two ridges, and to have thought that both Stacke and myself were speaking of the ridge containing the semicircular canal (supposed by Dr. Holmes to contain the facial canal), and not of what we both meant by ridge, namely, the portion of the posterior wall left standing. In no other way can I explain his words: "In other words, it would be dangerous at this point to attempt to widen the passage by chiselling away a portion of the aquæductus Fallopii," etc. Dr. Holmes must have

removed the cancellated bone overlying the horizontal semicircular canal, bone which is in the medial wall of the aditus, then of course the tuberosity of bone formed by the semicircular canal becomes part of the artificially enlarged aditus. Should one attempt to widen this cleft (between tuberosity and tegmen tympani) downward, it could only be done by cutting through the semicircular canal and afterward opening the facial canal. This is however not the cleft about which Stacke speaks. He would not have said that it was dangerous to the *facial* canal to widen downward a cleft the floor of which was formed by the *horizontal semicircular canal*. Stacke's cleft deep in lies between the true floor of the aditus and the tegmen tympani, and the tuberosity of bone formed by the semicircular canal is in the medial wall of the cleft. That this is what Stacke means is perfectly evident from his article. The removal of the posterior wall converts tympanum, meatus, aditus, and antrum into one large cavity. Stacke says the medial wall of this cavity is formed by the medial walls of the tympanum and attic, and by the aditus which is now a furrow running into the antrum (nun als Halbrinne in das Antrum mündenden Aditus). The aditus is a furrow and not a canal, because its lateral wall has been removed in taking away the wedge. After removing the wedge there remains a ridge of bone between meatus and antrum, and at the level of the *aditus* the width of the cleft (opening of communication between meatus and antrum) is limited by the same. (Stacke.)

"Now," says Stacke, and this is the point of contention, "should we at this point seek to widen the *aditus* downward, wounding of the facial would be unavoidable." *The floor of the aditus is external to the facial canal, and can be lowered downward without harm.* This is the criticism of Stacke which I made in my monograph, and this is what Dr. Holmes criticises in his article. I am found fault with for being too free with the chisel on the posterior wall, and then, in winding up his remarks, my critic says: "Besides, I see no occasion for running risks of injuring such important parts, for I have not found any difficulty in obtaining suf-

ficient room for inspection and treatment of the antrum and attic when *all of the posterior* (italics mine) and a portion of upper wall of external canal (pars ossea) has been removed." *When all of the posterior wall has been removed!* Taking away *all the posterior wall* is a procedure more radical than I ever thought of. How this sweeping sentence contradicts all that has gone before! Dr. Holmes has told us that the ridge (portion of posterior wall left standing after removing the wedge) can be obliterated up to within 10 mm of the annulus tympanicus, measured along the lower and posterior portion of canal; and here he claims to remove *all* the posterior wall.

In a footnote I find the following criticism of Plate VI. (my monograph): "If the drawing Plate VI (Allen's book) is correct, he has removed even less of the ridge between antrum and external canal than Stacke recommends." In this passage Dr. Holmes has a correct understanding of what Stacke meant by ridge. One of the bewildering things about this entire article is that Dr. Holmes correctly defines parts, and then subsequently makes statements which, according to his own definition, are absurd.

On the bone from which this Plate VI was made, all the posterior wall of the meatus lateral to a vertical plane tangent to the tuberosity of the semicircular canal has been removed. The floor of the meatus on this specimen passes uninterruptedly into the antrum—artificial canal cavity. The main portions of the antrum and aditus are, however, *farther outward* than the lower portion of the posterior wall, and this part of the wall is left standing. There is no necessity for removing it, and it could not be done anyhow, because the facial canal is situated within this portion of the posterior wall, or just posterior to it. This lower portion of the posterior wall is, however, and this is the point, medial to the antrum and aditus, is farther *inward* than the main portions of these cavities. The vertical ridge which shows in my plate has been artificially formed in cutting down the posterior wall from a point on the innermost edge of the floor of the aditus.

In closing these rather random remarks let me again em-

phasize the fact that if we wish to get at the true relation of parts of the organ of hearing to the surface, we must make sections which are truly horizontal. If the anatomy is studied on such and on vertical sections no difficulty will be experienced in properly locating the important parts.

PURULENT OTITIS MEDIA LEADING TO CRIES
OF THE TEMPORAL BONE, EPIMENINGEAL
ABSCESS, AND DEATH, WHILE THE MASTOID
PROCESS REMAINED INTACT.

BY GEO. REULING, M.D., BALTIMORE.

(With two figures in the text.)

On the 11th of June, 1892, Wm. H. Thomas, aged fifty-seven, entered the Eye and Ear Department of the Maryland General Hospital, with the following symptoms :

Over the whole right half of his head he complained of headache, lancinating pains toward the right eye, lower jaw, and muscles of the neck. This headache was greatly varying in degree, sometimes so violent as to cause nausea and vomiting, and then again only slightly felt as a so-called dull headache of uncertain localization, but never was his head free from pain. From the external auditory canal of the right ear, a thin and very spare watery discharge was oozing. The otoscopic examination revealed a largely perforated drumhead, the promontory covered with pale granulations. On probing beneath the granulations, a rough, corrugated bone-surface could be felt. The Eustachian tube was free. Upon pressure of the mastoid bone, very little if any sensitiveness was observed ; the region of the mastoid was not swollen, doughy, or red, neither was the auriculum abnormal in its position. The region of the fossa glenoidalis was occupied by a small, hard, lymphatic gland, which was painful on pressure ; the movements of the lower jaw were, however, normal. No sign of a facial paresis existed. The man had been making the rounds of the different ear-dispensaries of the city during the last two years, where treatment was apparently only directed for his otorrhœa.

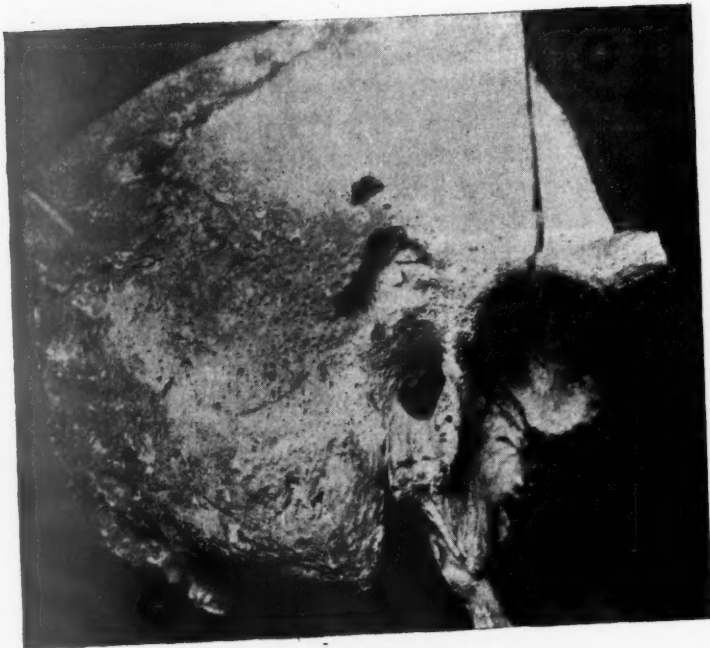


FIG. 1.



FIG. 2.

A CASE OF ANCHYLOSIS OF THE STAPES AND
A CASE OF NERVE DEAFNESS, WITH MAN-
OMETRIC EXAMINATIONS AND AUTOPSIES.

BY PROF. F. BEZOLD, MUNICH.

Translated by Dr. WARD A. HOLDEN.

(With Plate I, of vol. xxiv, of German edition.)

NOTWITHSTANDING the numerous clinical histories, aurists still differ in their views as to the functional symptoms dependent upon middle-ear affections and those dependent upon nerve diseases.

Continued clinical examinations in selected cases have given us results that leave no doubt as to the differential diagnostic value of the comparative examination of bone- and air-conduction and of tone perception.

Absolute proof, however, can be obtained only from the post-mortem examination of such cases as have exhibited in life the functional symptom-complex characteristic of each affection.

In 1885 I reported the post-mortem examination of a case of ankylosis of the stapes in which Rinne was negative and bone-conduction was increased. Politzer reported at the same time a similar case, and since then others have been reported.

The second case which I wish now to report was examined last year. It was entirely similar to the case I previously reported and to Katz's case. Here also there was bilateral excessive hardness of hearing with negative Rinne and increased bone-conduction notwithstanding old age.

Notice : The lithographic plate accompanying Dr. Bezold's paper on "Stapes Anchylosis" not yet having been received from Germany, will be furnished in our next issue together with other plates.

H. K.

There was also, as is found in all these cases, a shortening of the lower portion of the scale for air-conduction. We diagnosed anchylosis of the stapes in life, and the autopsy confirmed the diagnosis.

E. S., a woman of sixty-five, was admitted to the hospital for carcinoma ventriculi. Thirty-eight years before she had typhus, since which time her hearing has been poor and had gradually grown worse in the last nine years. No tinnitus, no giddiness. Father and sister hard of hearing.

Both malleus handles nearly horizontal, normal reflex on both *Mtt.* R. an opaque strip from the short process backward, without the formation of a fold; L. irregular opacity of the entire posterior half of the *Mt.* R. conversation not heard, L. at 2 cm. Bone-conduction for A on the vertex 19 sec. lengthened, for a' equal to mine. Rinné negative on each side; R. — 15, L. — 13 sec. (normal + 30 sec.).

The lower tone limit was h in each ear for air-conduction; the upper tone limit was R. Galton 6.4, L. 6.3 (normal limit of the whistle used 2.3). The limits are sharp. There are no breaks in the scale. Low forks not heard by air-conduction are still heard on the vertex.

Three weeks after the examination the patient died of pleuropneumonia. At the autopsy a carcinoma of the cardia was found.

Autopsy.—Both *Mtt* showed a fresh injection of the vessels of the malleus handle, which had not been present three weeks before. After the tympanic cavity had been sawed through parallel to the membrana tympani, the mucous membrane of the promontory was seen to be moderately injected but not much swollen. At the bottom of the cavity the membrane was moderately thickened. The mucous membrane of the ossicles was not thickened. There was considerable tenacious secretion in both cavities. On the right side the crura of the stapes were covered with thin semi-transparent mucous membranes, the upper one perforated; a similar membrane covered the niche of the round window. The tubes were wide and free from swelling or injection. The mucous membrane of the rhino-pharynx so far as preserved with the preparation was normal.

There was then a fresh middle-ear suppuration of mild degree, which was to be considered as a symptom of the

terminal pneumonia, particularly as Dr. Scheibe found the diplococcus pneumoniae in the secretion.

Before the tympanic cavities were opened manometric examinations were made; the results, however, were unfortunately complicated by the presence of mucus. Before the semicircular canals were opened, the pneumatic middle-ear cavities lying directly lateral to the canals were filed open, the right being filled with amber-colored serum, the left being empty.

Manometric examination (after cementing these cells).—The colored fluid in the manometer tube in the upper semicircular canal rose 1 cm in the right, and $\frac{1}{2}$ cm in the left with pressure on the interdural sac of the aqueduct. It rose in the right only, $\frac{1}{2}$ mm with pressure on the porus acust. int. It did not rise with pressure on the orifice of the aquæductus cochleæ on either side.

Right temporal bone. Tympanic cavity unopened. Inflation of air through a tube in the external canal caused the fluid in the labyrinth manometer to rise $1\frac{1}{2}$ mm, exhaustion of the air caused it to fall $2\frac{1}{4}$ mm. As ankylosis of both stapes was found later, the movements of the *Mt* must have been communicated to the membrane of the round window by the secretion in the tympanic cavity.

Compressing the air with a balloon from the Eustachian tube gave a positive movement of $4\frac{1}{2}$ mm, exhausting the air gave a negative movement of $3\frac{1}{2}$ mm.

After removing the tegmen tympani, compressing the air in the external canal produced a positive movement of 1 mm; and exhausting it, a movement of $\frac{1}{2}$ mm. A style, 10 cm long, cemented on the head of the malleus, moved outward 2 and inward 4 mm. This slight excursion may be explained by the fact that the *Mt* had been ruptured artificially.

Left temporal bone.

Tympanic cavity unopened.

From external canal + $\frac{1}{2}$ and - $\frac{1}{2}$ mm.

From the tube + 4 and - 4 mm.

Tympanic cavity opened.

From canal + 0 and - $\frac{1}{2}$ mm.

The style on the malleus moved outward 3 mm; inward, 7 mm. On the incus, outward, 1 mm; inward, 4 mm. The mobility in the malleus and the incus was much reduced but not lost.

After disarticulating the incus and stapedius and sawing through the tympanic cavity, the head of the stapes, on each side, was found to be quite immovable when touched with the sound. On the right side, where the labyrinth was sawed away, the fixation of the stapes could be demonstrated also from the foot-plate.

The foot-plate rests securely in the oval window even after the bone is macerated. Examined with a loupe from the inner side, the bony vestibular wall near the foot-plate appears rough, uneven, and of a more whitish-gray color than the surrounding bone.

The left temporal bone was cut in microscopic sections. Even microscopically the niche of the oval window was seen to be narrowed above by new formation of bone. In the outer labyrinthine wall there was a sharply defined bony mass staining differently from the normal bone (Fig. 1). The foot-plate of the stapes was, for the most part, surrounded by the new bone (Fig. 2). The new bone extended upward to the canals for the facial nerve, the tensor tympani, the nerves of the vestibule, and even to the vestibule itself, and between the first and second turns of the cochlea where it reached the periosteum but left the form of the depression unchanged. Only in the niche of the oval window did it form a projection from above, and also seemed to narrow the canal of the nerve for the outer semicircular canal.

The transformed bone consisted, for the most part, of young osteoid tissue with many medullary cavities, containing numerous giant cells. In some parts it consisted of spongy substance which took the place of the normal compact substance. The limits between the osteoid and the spongy tissue were not sharp, and the latter, poor in cells, seemed to represent a later developmental stage of the other. The younger osteoid substance was found, particularly on the labyrinth side; the older, spongy on the tympanic cavity side. The margin of the niche of the oval window, however, was partially formed of osteoid substance.

At three points in the niche the transformed bone reached the foot-plate itself and was adherent to it. These adhesions consisted of spongy substance for the most part.

The cartilaginous layer, which is normally found both on the margin of the foot-plate and on the margin of the niche, was wanting not only at the points of adhesion, but also in nearly the entire circumference of the niche. On the inner surface of the foot-plate the cartilage was present in considerable extent, but showed some abnormalities.

The lower portion of the niche was also formed in part of transformed bone substance. The periosteum of the pelvis ovalis was much thickened by increase in its connective-tissue elements. Both crura of the stapes were connected with the niche wall by tough connective tissue.

On the labyrinthine side of the foot-plate the periosteum was not much thickened, and the cartilage was preserved in great part.

The changes in the mucosa of the middle ear, due to the terminal suppuration, were limited to the superficial layers. The periosteal layer of the mucosa, in all parts of the tympanic cavity excepting the pelvis ovalis, was free from inflammation, and showed no changes indicative of sclerosis.

The malleo-incudal and incudo-stapedial articulations showed no changes. The tensor tympani appeared atrophic, the stapedius muscle well developed. The membrane of the round window, apart from a slight inflammatory thickening of its mucous layer, was normal.

The labyrinth also showed changes of a low degree. The lamina spiralis near the round window contained no nerve fibres, and in the farther course of the first turn there was a moderate increasing atrophy of the nerve. There was a trace of atrophy even in the second turn. The remaining nerve fibres stained well with Weigert's method. Corti's organ was well preserved, except in the first turn.

The nerve bundles for the ampulla of the outer semicircular canal were somewhat thinner, probably in consequence of the pressure exerted by the new bone. The nerve at the other semicircular canals and the vestibule were of normal thickness.

The chief cause of the excessive hardness of hearing in life was due to a bony adhesion between a portion of the foot-plate of the stapes and the pelvis ovalis in both ears.

This adhesion had been brought about by a sharply localized chronic inflammation of the bone in the neighborhood of the foot-plate and in the foot-plate itself, occupying a portion of the outer labyrinth wall, and which, from its microscopic appearance, would seem to have had its origin from the periosteum of the niche of the oval window, if not from the bone itself.

The atrophy of the nerve found in the first turn corresponded with the defect for the upper end of the scale found in life with Galton's whistle.

A case contrary to this is the following :

E. W., a woman of thirty, had long been hard of hearing. For fourteen days she has been ill with abdominal typhus, in which time her hearing has grown much worse.

Aural examination three weeks before death.—Patient's answers reliable.

Both *Mtt*, excepting a moderate opacity at the umbo, normal.

Conversation Right, 6 cm.

Left, not heard.

Lower tone limit Right, C#.

Left, D.

Upper tone limit Right, Galton 2.2.

Left, b¹.

Lucae's loud forks, c⁴ and f^{#4}, were not heard when the right was closed, a proof that the hearing was much diminished for these even on the right side. Fork a¹ was heard neither on the vertex nor on either mastoid.

On the right side, where this fork was heard by air, there was Rinné V. + t.

As shown by these tests, there was perception on the left side for only about 1½ octaves in the middle register. Bone-conduction was completely wanting.

Diagnosis.—Nerve deafness in both.

The left temporal bone was examined.

Some changes had occurred in the *Mt* since the examination three weeks before death. In the upper anterior quadrant and in the lower half there was a yellowish opacity, and the reflex was scarcely noticeable.

In the tegmen tympani were many translucent bony cells, partly of a bluish-red color. Mouth of the tube wide and pale.

Manometric examination (after cementing the cells).—Pressure on the aq. cochleæ caused the fluid in the tube to rise. Pressure on the porus acusticus int. did not produce any movement.

Tympanic cavity unopened : with positive pressure in canal, $+2$ mm ; with negative, -4 mm.

Saying "p" near the mouth of the tube caused a positive and negative excursion of $\frac{1}{2}$ mm.

From the tube a positive movement of 4 and a negative of 6 mm was produced (round window). Tympanic cavity opened by removing the tegmen tympani. Inflation through tube caused considerable muco-purulent secretion to be expelled through the tegmen, after which, from canal positive pressure, $+\frac{1}{4}$ mm ; negative, $-2\frac{1}{4}$ mm.

No movement when "p" was said near the tube. At the bottom of the tympanic cavity and in the antrum was considerable purulent secretion. The entire mucous membrane was swollen.

The head of the stapes moved normally. The mucous membrane of the middle ear was much more inflamed than in the preceding case.

The periosteum of the internal auditory meatus was normal. In the cochlea there was an atrophy of the nerve fibres similar to that in the other case, but more extensive. The atrophy was well marked in the first turn, less so in the second, and scarcely noticeable in the apex. The decrease in the number of atrophic fibres was inconstant and irregular, and this was also the case with the ganglion cells in Rosenthal's canal. The structures of the ductus cochlearis were poorly preserved in many places, so that nothing definite could be said in regard to Corti's organ.

There were other changes which probably should be considered the results of previous inflammatory changes and which possibly explain the nerve atrophy.

At the beginning of the first turn the ligamentum spirale was narrowed in the portion lying on the outer wall, and the portion passing over into the lamina spiralis was drawn out into the interior of the canal. At this point Reissner's membrane was adherent to the stria vascularis and the prominentia spiralis. In the further course of the basal turn a thin layer of cellular partially pigmented tissue lay on the periosteum of the lamina spiralis ossea. In the middle of the first turn a short, bony excrescence

with thickened periosteum arose from the cochlear wall. In the second turn was a similar excrescence. The nerve bundles for the utricle and the three semicircular canals were somewhat thinner than usual, the intermediate connective tissue increased. The epithelium of the macula of the utricle was shrunken and contained a cyst with granular contents. In another part a pigmented connective-tissue layer lay on the epithelium. The epithelium of the crista of the upper and outer semicircular canals was filled with finely granular pigment.

The nerve and the macula of the saccule were not well shown in the sections. The aqueducts showed no changes.

If we compare the two clinical histories, it is seen that the first showed the three cardinal symptoms on which I have been accustomed to base the diagnosis of a marked defect in the motility of the conducting apparatus, viz., negative Rinné, prolonged bone-conduction for low tones, and a large defect at the lower end of the scale for air-conduction. A small defect in the upper portion of the scale, as in this case, is not infrequent in sclerosis.

The second case was functionally the opposite of the first. Only a small portion in the middle register was preserved for air-conduction; bone-conduction was completely wanting, and Rinné in the other ear was positive.

The pathological examination in each case confirmed the clinical diagnosis. The fixation in the conducting apparatus in the first case was due to a bony anchylosis of the foot-plate of the stapes, affecting a considerable portion of the annular ligament.

The nerve deafness diagnosed in the second case was confirmed by the atrophy found in the first and second turns.

Both cases go to prove the truth of Hemholtz's theory. We should have expected to have found in Case 2 an atrophy in the third turn equal to that in the first. It is possible, however, that there were changes in Corti's organ which, in its poor state of preservation, escaped notice. On the other hand, there may have been a central lesion to account for the defect in the lower register. To be direct proof against the truth of Helmholtz's theory, an atrophy must have been found in a portion of the cochlear scale, and also good

hearing in life in that portion of the tone scale which, according to Helmholtz, corresponds to this portion of the cochlea.

Both cases illustrate the necessity of examining the ear with the continuous tone series, and also of comparing the air- and the bone-conduction, for a scientific application of the results of the functional examination and of the autopsy.

The pathological interest of the first case centres in the sharply circumscribed osteitis in the outer labyrinth wall, causing the ankylosis of the stapes.

As to the terminal middle-ear suppuration found in each case, it should be mentioned that serum was found in one portion of the middle ear and purulent secretion in another, while a more remote portion of the cells was empty.

In consequence of the terminal affection in the two cases, the manometric examination could not be expected to give unequivocal results. But the latter were such that they offered no features that might not be satisfactorily explained by the complications found.

EXPLANATION OF FIG. 1 (STAPES ANCHYLOSIS).

Vertical section through the outer labyrinth wall anterior to the pelvis ovalis and the first and second turns of the cochlea.

The diseased bone is recognized by its pale color (hematoxylin stain). A small portion near the tympanic cavity is spongy with many cavities. The larger portion lying between the first and second turns, consists of osteoid substance with numerous cells, the medullary cavities being completely filled with cells. The periosteum on the side of the tympanic cavity is thickened and vascular, and the superficial layer of the mucosa is infiltrated with pus cells (terminal otitis med. pur. acuta).

FIG. 2 (SAME MAGNIFICATION).

Vertical section through the pelvis ovalis and the foot-plate of the stapes.

The diseased bone is darker, as the specimen was stained with carmine. The upper portion of the foot-plate is much thickened, involved in the spongy transformed bone, and adherent to the margin of the pelvis ovalis. The inner surface only is covered

with cartilage. At the lower margin of the foot-plate the pathologically changed margin of the pelvis ovalis is rarefied and destroyed, so that the annular ligament appears very broad. The diseased bone extends upward to the canal for the nerves of the vestibule and the two upper ampullæ. The periosteum in the pelvis ovalis is much thickened—on the labyrinthine side of the foot-plate not perceptibly.

TWO CASES OF BASAL FRACTURE.

BY DR. SCHMIEDEKE, SURGEON GERMAN ARMY.

(With one figure in the text.)

Translated and abridged by Dr. J. A. SPALDING, Portland, Me.

CASE I.—A dragoon was brought to the hospital, November 22, 1892, in an unconscious condition. Whilst jumping his horse over a ditch he had fallen and struck the left side of his head against a log. He immediately became unconscious, breathed stertorously, and his pulse fell to 60. When brought to the hospital the pulse was faster, and there was slight epistaxis. The right pupil reacted; the action of the left, owing to swelling of the parts, could not be determined. Slight vomiting of blood, probably from that which had run from the nose and had been swallowed. Great sensitiveness to pressure all over the left side of the head. Eye movements appear normal. There is no blood in the external meatus on either side, and both *Mt* are normal. The hearing could not be tested; there seemed to be no loss of sensitiveness in the skin; and no paresis was visible.

For eight days the patient remained about the same, though the swelling around the left eye gradually decreased, so that a complete oculomotor paralysis could be discovered. Ptosis, heteronymous diplopia, difference in level of the images, and deviation of eyeball outward. No ophthalmoscopic alterations. Hearing normal in both ears. Loss of smell; and vertigo on attempting to stand.

Consciousness returned slowly, and on the sixteenth day suppurative tonsillitis set in, followed by otorrhœa on the left side and rapid decrease in hearing. Perforation could not actually be determined, but the meatus was so much swollen that the examination was extremely difficult. At the end of another week the

suppuration from the left ear increased, the temperature rose to 39.2° C. (102.8° F.), pain became severe all over the head, and hearing in the left ear was lost. Before narcotizing the patient on the following day, preparatory to chiselling the mastoid, he said that the diplopia had disappeared, and it was noticed that the globe was in its normal position.

On laying bare the mastoid, we discovered a fine fissure in the bone, 3 *cm* long, about 1 *cm* behind the bony portion of the meatus, and the same distance above the summit of the mastoid process. A drop of pus was escaping from the lower end. The chisel easily entered the antrum, and a small amount of pus was evacuated. The secretion soon became serous, and in about three weeks ceased. Four weeks after the operation the wound was closed. No symptoms were noticed during recovery, except extreme vertigo on attempting to stand or walk. The patient was discharged about the end of March, with normal hearing in the left ear, and good vision. The sense of smell was lost; no alterations inside the nostrils. The left side of the face was constantly reddened in comparison with the right, and perspired more freely. Occasional ache in the left side of the head.

The explanation of the various disturbances following the injury is as follows:

After establishing the presence of the fissure in the temporal bone, which corresponded with the external base of the pyramid, it seemed as if we should hold an extension of the external fracture into the pyramid responsible for all the disturbances. We should then assume that the anterior upper surface had been affected by the fracture, and had excited intracranial hemorrhage in the middle cranial fossa, giving rise to the oculo-motor paralysis and the long unconsciousness. As resorption followed, consciousness and the paralysis gradually improved, so that on the twenty-fourth day the patient was wholly conscious, and had good vision.

The hearing was not affected by the injury, and did not become impaired until the otorrhœa, excited by tonsillitis, set in on the seventeenth day. On the contrary, there was much dizziness from the time of the accident, gradually decreasing as time went on, then increasing greatly after the

operation, and finally decreasing once more. But, even when the patient was able to sit up out of bed, he was dizzy on attempting to walk out-of-doors.

If we accept a lesion of the anterior superior surface of the pyramid, we can imagine the fracture running in such a way as to touch the superior semicircular canal and produce the vertigo, which did not entirely disappear for three or four months. Moreover, if the fracture ran in that direction, we could harmonize with the injury the absence of loss of hearing.

The favorable course of the middle-ear suppuration, which, despite encroachment upon the cells of the mastoid process, did not produce any further disturbance, can be utilized as proof that by this time the fracture in the pyramidal portion of the temporal bone was healed; otherwise, the suppuration must have extended to the meninges of the brain.

The loss of smell may have depended upon rupture of the olfactory bulbs when the patient fell. Nevertheless, as the nose was considerably crushed by the accident, and as the middle turbinated bones still exhibit hypertrophic mucosa, the anosmia may be referred to an obstruction in the nose.

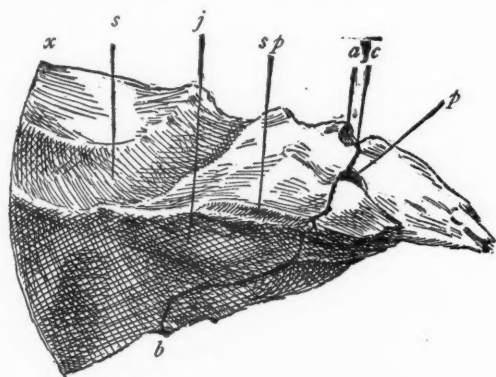
CASE 2.—February 11, 1893, a soldier fell 20 *m* upon the hard earth on the right side of his head; hemorrhage from the right ear and vomiting. Three hours after the accident he was brought to the hospital, where, during the dressing of an extensive injury of the soft parts about the right knee, he appeared to be perfectly conscious, and gave apparently correct answers to all questions. His chief complaint was of pain in the right side of his head.

Leaving aside the hemorrhage from the right ear, and the vomiting, which was repeatedly observed during the following night, the patient exhibited many grave and serious symptoms: nystagmus, inability to open his mouth, and apparently total deafness. The meatus was filled with coagulated blood, sufficiently to prevent any view of the *Mt*. The facial nerve did not seem to be affected, and there was no sensation of vertigo. Basal fracture seemed correctly diagnosticable under these cir-

cumstances, and was confirmed by the further course of the case.

High fever set in on the following day, and a gradual increase in inflammatory symptoms. The discharge from the right ear, at first scant and bloody, gradually became colorless and extremely abundant. Meningitis rapidly ensued, and the patient died on the fourth day after the injury.

The autopsy revealed an extravasation of blood as large as a silver dollar on the outer and inner surface of the squamous portion of the temporal bone, and a fracture through the squamous portion to the sutura squamosa, and extending upward perpendicularly in front of the porus acusticus externus.



After removal of the brain, a suppurative inflammation of the dura and pia at the base and surface was discovered, originating, in all probability, from the right porus acusticus. Removal of the apparently normal dura showed a complete transverse fracture of the pyramid, in connection with the fissure in the squamous portion. The fracture did not seem to affect the left half of the skull.

Removal of the temporal bone enabled the fracture to be followed more closely, and pus to be discovered in the tympanum and porus acusticus.

The connection between the meningitis (the cause of death) and the injury could not be doubted.

The annexed drawing of the specimen, well preserved in Wickersheimer's fluid, shows the course of the fracture on the two cerebral surfaces of the pyramid; *s* signifies the region of the sinus sigmoideus; *p*, the porus acusticus internus; *a*, the aqueduct of the cochlea; *sp*, the sulcus petrosus superior; *j*, the

jugum petrorsum ; x , the angle made by the upper horizontal and the posterior frontal sawing for the removal of the temporal bone. We are to imagine the line of the fracture, $b c$, as extended beyond b anteriorly, quite as far as the superior margin of the squamous portion. The petrous bone had been completely fractured. Therefore to the upper line of fracture visible in the picture, there is a corresponding lower line. The upper fracture runs from the aqueduct to the lateral margin of the porus acusticus internus, past there to the upper corner of the petrous bone, and at the anterior (superior) surface it takes a direction perpendicular to the upper corner through the tegmen tympani to the depression in the summit, and so through the roof of the external meatus outward. The anterior squamous-like bony plate of the os tympanicum, which in this case is extended very far above and behind, remained intact, and formed, with the cuticular covering of the meatus, a closed tube.

The line of fracture on the inferior surface runs sharply defined between the fossa jugularis and the carotid canal perpendicularly over the vaginal process of the os tympanicum, as far as the Glasserian fissure. Then, bending around outward, it runs parallel to the Glasserian fissure, and passes close behind the posterior auricular process into the upper line of fracture. The junction of the united lines of fracture in the squamous portion lies at the point of the porus acusticus externus, which corresponds precisely with the middle line between the spina supra meatum and the posterior auricular process.

The petrous bone is divided by the fracture into a medial and lateral half, and after removal of the whole bone its petrous portion gaped several *mm* asunder, so that we could see a portion of both fractured surfaces. The uninjured facial nerve and chorda tympani could be seen within the fissure, holding as it were the two fractured portions together. After division of these two nerves, the fractured portions were united solely by the soft parts on the inferior surface, which permitted them to be separated like the leaves of a book for inspection.

A portion of the *Mt* with the hammer followed the medial fracture ; the ligamentum mallei is in contact with the hammer, the head of which remains imbedded in the anterior portion of the cupola, with its ligament. We can also recognize the anterior fold ; the posterior lies with the anvil on the other portion of the bone.

The line of fracture on the wall of the labyrinth runs from above downward, passes through the facial canal directly across the foramen ovale, and separates from the latter quite a portion of its anterior circumference, so that the greatest part of the foramen vestibuli with the uninjured stapes remains with the lateral portion of the fractured bone. The anvil and stapes remain connected with each other. The result of this is that the labyrinth and the beginning of the cochlea are visible. The posterior and horizontal semicircular canals are normal, and their orifices plainly visible; the ampullar orifice of the upper canal is affected longitudinally by the fracture. The corresponding portion of the medial fractured bone contains a slight depression. As this was probably nothing but a flat rupture in the longitudinal direction, it is quite possible that the cuticular portion appertaining to the same remained unharmed. The cochlea is affected in the first convolution, only the beginning being still connected with the labyrinth, the greater portion having followed the medial portion of the bone. The fenestra rotunda lies on the lateral portion of the bone, as well as a small segment of the porus acusticus internus in the form of a flat gutter.

This condition of affairs explains the right-sided deafness, the hemorrhage from the ear, and the difficulty in opening the mouth, while the nystagmus must be regarded as a reflex action from the injured inner ear.

Comparison of the two cases shows how differently the injuries acted on the general condition of the patients. In the first, unconsciousness for days, and vertigo for months; and in the second, complete consciousness and capacity for expression (until meningitis ensued).

It is possible that in the first case the general disturbances, as already suggested, were due to intracranial hemorrhages in the middle cranial fossa, produced by a lesion of the dura against the fracture at the anterior surface of the pyramid; while in the second case, as the autopsy verified, the dura remained intact, and, owing to this, the actual fissure transversely across the pyramid shut itself up in such a way that the blood could not escape. Hence the abundant discharge of colorless fluid, from the second day on, could not be referred to the brain as its source, but to the opened labyrinth.

A CASE OF PRIMARY TUBERCULOSIS OF THE MASTOID PROCESS.

By HERMAN KNAPP.

SCHWARTZE in his excellent monograph on the *Operations on the Ear*,¹ declares primary otitis, and in particular primary tuberculosis, of the mastoid process to be an eminently rare affection, in the diagnosis of which we could not be too reserved nor too distrustful. This assertion may be true in general, but on the other hand, as far as bone tuberculosis of the temporal is concerned, the rarity with which we diagnosticate this affection may be owing to the omission of special bacteriological examinations of carious bones of the ear. Not long ago nobody thought of considering the not infrequent cases of caries of the orbital margin as bone tuberculosis, yet at present the majority of them is demonstrated to be of that nature. An example of primary caries of the mastoid, the tubercular origin of which none of my readers will doubt, although no bacteriological examination was made, came under my care at the N. Y. Ophthalmic and Aural Institute.

Milly Cuneo, æt. five, of 236 Bleecker Street, New York City, was brought to the clinic in December, 1892. She was a pale, ill-fed, neglected child of scrofulous habit. She had a spondylitic ulcer on her back and a large granulating ulcer under the left ankle. A large ulcer was on the upper margin of the right and another on the lower outer margin of the left eye. The right mastoid and supra-auricular portion of the temporal bone were

¹ *Handbuch der Ohrenheilkunde*, Bd. ii., 1893, p. 797.

swollen, ulcerous, granulating, and discharging fetid matter. Both auricles, ear-canals, tympanic membranes, and middle ears were perfectly normal as far as physical examination could discover. Hearing in both ears unimpaired. This condition had existed for many months.

On Dec. 22, 1892, I opened largely the diseased parts of both orbits and removed extensive pieces of necrosed bone, in particular a part of the left zygomatic. Then I made a curved incision 1 *cm* behind the insertion of the right auricle, 4 *cm* in extent, down to the bone, from the zygomatic ridge of the squama through the linea temporalis as far as the tip of the mastoid. The bone was carious and several fistulæ led into the interior. The whole outer table of the mastoid was chiselled away. Its interior and the adjacent part of the squama were a mass of decaying bone substance which was broken down and carefully removed with a sharp spoon. The operation was prolonged until the walls of the cavity thus established felt hard and appeared healthy. All the wounds were washed out with corrosive sublimate 1:5000, those of the orbits covered, that of the mastoid tamponed, with corrosive sublimate gauze. The wound in the mastoid was syringed and dressed daily. It healed up in a few months, in the same way as the wounds at the orbit.

Jan. 26, 1894, I saw the child again. She had improved much in general health. A deep conical depression was running from below upward in the right mastoid, perfectly covered with skin, and causing no discomfort. A depressed scar without ectropium was on the right orbital margin, and another with ectropium of the lower eyelid on the left side. At the left ankle-joint, immediately below the external malleolus, there was still an extensive ulcer filled with granulations. In the left external ear-canal there was a collection of pus which I liberated by a free incision. No other abnormality in the ears. The child has always heard as well as other children. I sent her to the Roosevelt Hospital to have her foot treated.

The disease in the mastoid of this child is only a part of a widespread tubercular bone affection. What part tuberculosis plays in necrotic tympanic and mastoid disease is not yet sufficiently known. Investigations in this direction could be done easily enough in aural clinics with which a bacteriological laboratory is connected, or which have access to any

such institution. It will not be sufficient to examine only microscopically for tubercle bacilli, the secretions, sequestra, and the granulation tissue, for in tissues these are very difficult to find. Inoculations with the morbid substances should be made on animals, by preference into the anterior chamber of rabbits, where the picture of inoculation tuberculosis is well known. As bone tuberculosis frequently is a local disease, its recognition in the ear would be valuable both prognostically and therapeutically.

ON SERO-MUCOUS CYSTS BENEATH THE WING
OF THE NOSE ; WITH THE REPORT
OF A CASE.

By HERMAN KNAPP.

CYSTIC tumors in the nasal fossæ are rare. ZUCKERKANDL in his classical treatise¹ says that once only had he seen a cyst the size of a walnut, in the mucous membrane at the anterior end of the lower nasal passage. It was filled with a honey-like liquid.

P. MCBRIDE² mentions that he found a cystic tumor which caused bulging of the mucosa just below the anterior extremity of the inferior turbinated body. An exploratory puncture resulted in a flow of serous fluid.

At the meeting of the Society of Laryngology, Otology, and Rhinology, of Paris, held Dec. 4, 1891, Dr. HY. CHATELLIER read a paper entitled, "Glandular Retention Cysts of the Anterior Part of the Nasal Fossæ," which is extensively reported in the *Journ. of Laryng., Rhinol., and Otol.*, 1892, p. 182. Chatellier details two cases which are almost identical with the one that came under my care. In the first, a woman of fifty-five years of age, presented a painless round tumor of the right lateral region of the nose, raising the skin of the ala of the nose and extending toward the malar bone. On the inner surface of the ala it was getting into the vestibule and reaching to the anterior end of the inferior turbinated. On palpation it was found the

¹ *Normale u. Pathologische Anatomie der Nasenhöhle.* Wien, 1882, vol. i., p. 100.

² *Diseases of the Throat, Nose, and Ear.* Phila., P. Blakiston, Son, & Co., 1892, p. 303.

size of an almond, firm, resistant, as if filled with fluid, not adherent to the bone, on which it could be easily displaced. The interior of the nose otherwise healthy. Its commencement could not be traced, but the patient had noticed a marked increase during the last fortnight.

The second case occurred in a woman of thirty-two. A tumor, ovoid, the size of an almond, painless, cyst-like, movable, projected into the vestibule of the nose and extended under the skin adjacent to the ala. The patient did not suffer from it, but became alarmed at its increase of size.

In the discussion MARTIN stated that he had seen a similar case in the left nostril.

CARTAZ remarked that these cysts were very rare, only a few such cases having been reported.

We can increase this meagre record by another entirely similar case. Its history is as follows:

Virginia R., æt. forty-seven, of Monterey, Mexico, consulted me May 16, 1893. Seven years previously, the skin at the base of the left ala nasi was swollen and inflamed for three weeks and then was as before. Eighteen months ago the swelling returned in the same place but had not disappeared, interfering with breathing. When she presented herself, I found the following condition: A soft, fluctuating tumor, with small resistant walls, can be felt in the skin adjacent to the base of the wing and in the vestibule of the left nostril. The intra-nasal portion is covered with a smooth, evenly pink, not particularly vascular mucous membrane, free from irritation, painless on pressure, not reduced in size by cocaine. It apparently is connected with the periosteum of the floor of the nose, 3 *cm* long, 3 *cm* high, whereas the external portion extends 2 *cm* from the wing of the nose toward the cheek. The interior portion leaves the septum free, touches the anterior end of the inferior turbinated bone, and passes underneath the ala nasi over into the exterior portion. The tumor seemed to have no connection with any of the accessory cavities of the nose. It disfigured the patient by raising the wing of the nose and the adjacent skin of the cheek, but caused no other discomfort except difficulty in breathing. I advised her to have it removed, but before doing so to consult Dr. Bosworth.

Dr. Bosworth considered the tumor to be a cyst, in which opinion I concurred. He endorsed my proposition of removing the tumor and was kind enough to be present at the operation. He favored the removal by Rouge's method (reaching the growth from below after detaching the upper lip from the periosteum. See Bosworth's *Diseases of the Nose and Throat*, vol. i., p. 626), I preferred that by Dieffenbach (see Bosworth, *l. c.*, p. 624), and performed the operation at the N. Y. Ophthalmic and Aural Institute, May 20, 1893, in the following manner.

The region of operation being sterilized, the patient under ether, an incision was made along the base of the left ala nasi 2.5 cm upward. After carefully dissecting the skin and fibrous tissue covering the tumor the surface of the latter presented itself as a dark blue, delicate membrane, evidently the wall of a serous or mucous cyst. When the malar portion of the tumor was isolated, the wing of the nose was freed and drawn upward to make free space for the separation of the nasal portion. The whole tumor, laid bare, was uniform, elliptical, as large as a walnut, and connected with the periosteum, as are many atheromatous cysts of the eyebrow. In detaching it from the periosteum its wall was accidentally incised and a clear, mucoid, liquid flowed out. The sac was then cleanly detached from the periosteum and the wound washed with a 1:5000 solution of bichloride of mercury. After cessation of the insignificant hemorrhage, the severed ala was united to its base by two delicate sutures.

The next two days the operation was followed by some fever (temp. up to 101.5°) and slight swelling in the region of the wound. This all disappeared, and the patient was discharged cured in a week. I saw her occasionally for several months. The naris was perfectly free, but instead of the former swelling of the wing and adjacent cheek the angle of the nose was slightly depressed and drawn up.

The *origin* of the sero-mucous cysts in the anterior part of the nose is obscure. They do not seem to connect with any natural cavity, in none of the cases any such connection having been discovered. They are so identical in all their features that they seem to have the same cause. Until further knowledge determines their proper place in the classification of nasal disease, I propose to call them, according to the features they have in common, sero-mucous cysts be-

neath the wing of the nose. Regarding their pathogenesis, Chatellier says that some owe their origin to obstruction of a gland, in others the explanation cannot be given. Cartaz says: "Cysts of the middle turbinated are most frequent, but when situated in another region their mode of development is not intelligible."

Prognostically they belong to the benign formations.

With regard to their *treatment* we have to choose between three methods:

1. *Evacuation by paracentesis.* Martin states that in his case single puncture produced a cure without recurrence. McBride says of his first case: "An exploratory puncture resulted in a flow of serous liquid. The cyst collapsed, but filled again, so that another puncture was made with the same result. The patient was told to return for further treatment if the tumor recurred, but as she did not do so I presume the fluid was not again secreted.[?] In the second case of the same description, I was unable to obtain a cure, so that Mr. Duncan, at my request, dissected out the cyst, after reflecting the upper lip." In the first of Dr. Chatellier's cases a puncture with a Pravaz' syringe led to a speedy relapse.

2. *Destruction of the interior surface of the cyst with heat or chemicals.*—In the case of Chatellier, just mentioned, a permanent cure was obtained by singeing the internal surface of the tumor with the galvano-cautery; in his second case, by injections of liquor Van Swieten, repeated several times until the fluid withdrawn was normal.

3. *Extirpation*, either by Rouge's method (case of McBride-Duncan), or Dieffenbach's (my own case).

The *first* mode of treatment seems to be as unreliable in this as it is in other cysts. The *second* method, cauterization of the inner surface of the sac, may effect a cure, but judging from its merits in general surgery, it is tedious, and if a portion of the cyst-wall escapes destruction, a relapse will occur, of which fact the caustic treatment of the mucocele of the lachrymal sac may be mentioned as a familiar example. The *third* method, being radical, always effects a permanent cure.

REMOVAL OF SEQUESTRA AND A TOOTH FROM THE FLOOR OF THE NOSE.

By HERMAN KNAPP.

Edward Taylor, a healthy-looking-boy of seven years of age, of New York City, came to my clinic at the N. Y. Ophthalmic and Aural Institute December 16, 1892, with necrotic rhinitis and acute purulent otitis on the left side, and an hypertrophied tonsil on the right. The right nostril being pervious and fairly healthy he had not sought medical help before his left ear gave him trouble. I found the lower passage of his left nostril blocked with muco-pus and decaying soft and hard masses of tissue. I cleansed the nose and let him wash and gently syringe it with boric acid water for a few days, and on December 21, 1893, removed with forceps all the dead material from the nostril. Among the sequestra two were conspicuous: the one, flat and hard, was removed from the lateral side of the floor of the nostril, bordering the malar antrum; the other, from the anterior part, was cancellous and enclosed a tooth, the crown of which appeared to be turned up and back. The sequestrum was 15 mm long, and represented a piece of the upper jaw, the rounded alveolar surfaces separated by a layer of cancellous bone 3-5 mm thick. The tooth was the lateral incisor, its crown healthy and well formed, 12 mm long and 8 mm broad. Its root was decayed. Between the first incisor and the canine a probe could be passed through a rough-walled canal from the mouth into the nose, its direction being toward the nasal septum. It was omitted to ascertain whether and how large a communication existed between the nasal and the malar cavity. The boy improved quickly and left off treatment.

It seemed to me that the tooth was inverted, yet I could not assert this positively, as I found the tooth projecting

into the nose, and extracted it with the sequestrum from the alveolar process to which it belonged. It is quite likely that such an inversion had taken place of which Zuckerkandl describes and depicts a very fine example,¹ and quotes the dentist SALTER, referred to by Sternberg² as having noticed such inversions at the upper incisors, the crowns of which appeared in the nostrils, out of which they had to be extracted.

It may, however, also be supposed that the tooth was in its natural position, and was carried up into the nostril with the sequestrum from the alveolar process of the maxillary bone. Caries or necrosis of this part of the maxillary is common, as we know from numerous cases of empyema of Highmore's antrum. I am not aware that dislocation of teeth into this cavity has ever been noticed, which, perhaps, is only a confession of my ignorance. Be this as it may, the above communication records an example of necrosis of the floor of the nose and the removal of a loose sequestrum with the corresponding incisor tooth, through the anterior naris. That an inverted tooth, projecting over the floor of the nose, should produce caries and necrosis of its alveolar walls, seems very natural if we think how easily the nasal secretion, retained by the tooth, may decay and infect the bed and the crown of the tooth.

¹ *Anatomie der Nasenhöhle*, 2ter Band, 1892, p. 163; plate xix., figs. 3 and 4.

² In *Handbuch der Zahnheilkunde*. Herausgegeben von J. Scheff.

THE PERCUSSION OF THE MASTOID PROCESS,
WITH THE REPORT OF A RECENT CASE OF
DIABETIC CARIES OF THIS PORTION OF THE
TEMPORAL BONE.

BY O. KOERNER AND R. VON WILD, FRANKFORT-ON-THE-
MAIN.

Translated by Dr. S. E. ALLEN, Cincinnati.

AS is well known, weighty difficulties often present themselves in the diagnosis of bone disease within the mastoid. Extensive destruction of the bone substance, possibly reaching to the dura, not infrequently quickly develops, while the cortex and the overlying soft parts present no signs of disease. Indeed, increased sensibility to pressure may still be absent. Such extensive breaking down we have seen occur particularly in diabetic patients, and as a sequence to influenza.

Where external symptoms are absent, and where there is but slight pain and a continued normal temperature, the positive establishment of bone disease is often difficult or impossible. In these cases an operation is undertaken only when the appearance of meningeal irritation renders the diagnosis of bone disease certain, and points at the same time to the moment when a more serious stage of the disease has begun, so that operative help may easily come too late. Every expedient, therefore, which aids in the early diagnosis of this form of disease, deserves thorough consideration.

In this respect, Lücke's method of bone percussion rendered us, in two cases, surprisingly good service. External signs of mastoid disease were absent in both cases; there was

neither swelling of the soft parts nor increased sensibility to pressure. In one case, that of a patient under treatment for an acute middle-ear suppuration, we owed the early diagnosis and the opportune operative aid entirely to the development of dulness on percussion over the mastoid.

First of all, we will report the cases.

First Case.—G——, coal merchant, aged sixty, was seized unaccountably on the evening of September 7, 1891, with violent pain in the depths of the right ear. This diminished during each day, increasing again at night. Early in the morning of September 12th, an abundant purulent discharge set in; after which the pains lessened, ceasing now and then for hours, without, however, permanently disappearing.

At the request of his physician, Dr. Elle, one of us saw the patient for the first time on September 22d. He, a powerfully built and fairly well nourished man, complained of an abundant aural discharge, and of frequent pains deep in and behind the ear. These pains often radiated out over the entire half of the cranium. Temperature and pulse normal. There was a perforation the size of a pin-head in the middle of the posterior half of the drum, from which odorless pus flowed copiously. The epidermis of the drum was swollen so that only the processus brevis was visible. The mastoid was found to be perfectly normal on careful palpation and comparison with the other side. Nowhere was it sensitive to pressure. The tuning-fork on the head heard better in diseased ear.

Three days later (September 25th) the drum appeared the same, and the pains had not ceased. A slight swelling was now visible on the posterior superior wall of the meatus. The outer and posterior portion of the mastoid was normal, but there was a slight periosteal swelling, sensitive to pressure, on the anterior surface of the tip.

This new condition, in connection with the fact that the pain had continued in spite of the abundant discharge, forced the assumption that we had to do with an acute destructive process within the mastoid. As the course of the disease up to this time was similar to that of a case of diabetic caries of the mastoid reported by Koerner,¹ the suspicion was awakened that here a simi-

¹ O. Koerner, "A Case of Primary Diabetic Otitis of the Mastoid Process, with Remarks on the Influence of Major Operations on the Course of Diabetes," *Arch. f. Ohrenh.*, Bd. xxix., S. 61.

lar condition existed. Upon being questioned, the patient stated that he had suffered from a cough with expectoration, from the beginning of June to the middle of August, and had slowly but continually lost flesh since; this, although his appetite was remarkably good—better than it had ever been before. The amount of urine secreted was abundant; his thirst, however, was not particularly increased. The examination of the urine made then and there showed a marked amount of sugar.

On account of the well known tendency of diabetic caries to rapid extension, we resolved to open up the mastoid on the next day, and the patient was instructed to save all the urine. During the interval (about twenty hours), on an ordinary mixed diet, 88 grams of sugar were excreted. The urine contained no albumen, no acetone, and no oxybutyric acid.

We operated on September 26th, in the presence of Dr. Elle. *When under the anæsthetic, both mastoids were percussed with a small metal hammer. Forcible percussion disclosed absolute dulness over the entire mastoid on the diseased side, whereas on the healthy side we got ordinary osseous resonance, such as could be obtained over other portions of the skull where the soft parts were of like thickness.*

The incision was made about one *cm* behind the line of insertion of the auricle, beginning above the linea temporalis and extending down almost to the tip of the process. Periosteum and outer surface of the bone normal. The opening into the bone was started below the linea temporalis and in the line of incision. At a depth of about three *mm*, the chisel came upon discolored, necrotic bone, mixed with granulations and pus. The bone was so soft that larger fragments came away than were taken up by the sharp spoon. The alteration extended down to the tip of the process, and also to the transverse sinus. The sinus and a part of the dura covering cerebellum were laid bare. The dura and sinus normal, and not covered with granulations. The sinus does not pulsate. The undermined cortex was removed in all directions with cutting forceps. The parts were disinfected with a strong sublimate solution, and tamponed with iodoform mull.

Evening, temperature normal; pulse 78; less pain.

September 27th.—Temperature normal. Pulse 72. No more pain.

September 29th.—External bandages changed, wound cavity left alone. But little pus in the meatus, and when this was cleaned away no more was seen to well up out of the perforation.

September 30th.—Iodoform tampon changed. The sinus now pulsates strongly.

October 3d.—Since the changing of the bandages on the 29th, the meatus has remained dry.

October 18th.—The wound is granulating nicely and closing. Perforation in the drum healed.

By the end of October, owing to the anti-diabetic diet maintained since the operation, the sugar had disappeared from the urine and did not return when the daily allowance of bread was increased. In spite of all this the patient continued to feel weak and exhausted.

On the morning of October 27th, a chill occurred which lasted one half hour, and was preceded by a slight diffuse headache. On changing the bandages at noon, the wound was found in good condition. Temperature (three hours after the chill) 38.2° .

On the next day (October 28th), the patient complained of pain and sensitiveness to pressure over the ninth rib on the left side, a few *cm* outside of the mammillary line. The pain is increased slightly on deep inspiration. Percussion and auscultation negative. Morning temperature 37.0° , evening. 38.2° .

An encapsulated empyema the size of a fist began to develop at the sensitive point. This was opened on December 8th, and in twelve days had healed. The cavity in the mastoid was completely covered with epidermis by the 24th of December. Watch heard on this side at a distance of 15 *cm*. The drum membrane normal with the exception of a cicatrix behind the umbo.

The patient kept on emaciating even after the cure of the empyema. The anti-diabetic diet was now entirely given up, as but slight traces of sugar appeared in the urine even after ingestion of food containing flour and sugar. In spite, however, of continual variation in the diet, the appetite became so reduced that, for the most part, it was only with the greatest pains that the patient could be gotten to take any nourishment at all. From the end of December on, the urine became dark brown on the addition of ferric chloride (diacetonuria). This reaction had never taken place before. Furthermore, pains began in the gastric and lumbar regions. These slowly increased and became so severe that injections of morphia had to be resorted to. A cause for this condition could not be found. Toward the end of January a mild delirium set in, and œdema of the feet, and the patient died on February 7, 1892. A post-mortem examination was not allowed. It

may be remarked that there were no symptoms pointing to an accumulation of pus within the skull.

SUMMARY.

In summing up the points in this case, we shall speak only of the diabetic disease of the mastoid. The results from percussion we shall discuss in connection with the second case.

We have to do here with a typical example of the acute mastoid caries which occurs in diabetic patients, as has been described by Kuhn¹ and Koerner.² An apparently healthy man is seized unaccountably with severe pain in the ear. Four and one half days later the pus breaks through the tympanic membrane, but the pain does not cease thereafter. The location of the pain, and the fact that it continued in connection with a free discharge, point to disease within the mastoid. The afebrile course and the severity of the symptoms awaken the suspicion of diabetic caries. The examination of the urine proves the correctness of this supposition. *When the mastoid is opened, only nineteen days from the time when the pain began, its interior is found to be already destroyed from the tip to the dura and transverse sinus.* After thorough removal of all the diseased bone, the purulent discharge ceases immediately, and the perforation closes between the seventh and twenty-second day.

It certainly follows from these data that we had to do with a bone suppuration arising primarily in the mastoid, and which discharged through the natural channel into the tympanic cavity, making its way outward after rupture of the drum. It is a view familiar to otologists but disputed by surgeons, that the greater number of mastoid affections result from the extension of tympanic suppuration to the mastoid cells. This, however, does not apply to caries occurring in diabetic patients—(Koerner, *l. c.*). To us the

¹ Kuhn, *Arch., für Ohrenh.*, Bd. xxix., S. 29.

² Koerner, *l. c.*—The literature is given in these articles. A case of Huguénin, reported in his article in Ziemssen's *Pathologie and Therapie*, also belongs here. Also a case reported by Ferrer, *Zeitschrift für Ohrenh.*, Bd. xx., Case 6.

sudden occurrence of pain in this case does not denote the beginning of an inflammation in the tympanum, which inflammation afterwards extended into the mastoid, but rather, the moment in which the pus broke from the mastoid cells into the tympanic cavity. The surest proof, however, that the tympanic cavity was not diseased, but simply served as an outlet for the pus, lies in the fact that the tympanic suppuration ceased immediately after the removal of the diseased bone, the perforation in drum closing soon after.¹ The empyema pleuræ is to be regarded as a metastatic affection. The bone disease extended to the sinus, and it is easily possible that from here infectious matter got into the circulation. The simultaneous occurrence of the chill and of pain at the point where the empyema subsequently developed, allows of hardly any other interpretation.

Second Case.—Herr Müller-Dienst, sixty-three years old, was examined for the first time on March 9, 1892. He stated that he had always been healthy, and particularly that he had never had ear trouble. Three weeks ago, during a slight attack of coryza, he noticed a watery discharge from the left ear. This he said subsequently became purulent. Neither at the commencement nor during the course of the trouble did he have any pain.

The examination of the left ear disclosed a small amount of muco-purulent odorless secretion in the canal, and a perforation the size of a hemp-seed in the lower posterior quadrant. A granulation was seen behind the perforation, partly occluding it. Epidermis of the remaining portion of the drum swollen, the outlines of the hammer perceptible. Tuning-fork on the head more pronounced in the diseased ear. Right ear normal.

The granulation was immediately removed with a pincette. There was no fever. The general condition was good, so that the patient could go about his business undisturbed. No sugar in the urine.

During the following weeks the patient came for examination once or twice a week. The discharge did not diminish. It was necessary several times to destroy the recurring granulation with chromic acid. *At every examination a comparative percussion*

¹(No proof at all. Genuine tympanic suppuration generally ceases, as if by magic, after the operation.—*Translator.*)

of both mastoids was made and both sides gave a like normal osseous resonance. On April 16th, however, percussion on the left side showed a distinctly lessened resonance, immediately noticed also by the patient himself. Pain on percussion was not complained of. Constant comparison during careful palpation showed both sides to be still normal. A slight swelling not sensitive to the touch had, however, appeared on the posterior superior wall of the meatus near the drum.

It was at once decided to open the mastoid. The patient, however, remained away for eight days. During this time a fistula had partially developed on the posterior inferior wall of the meatus, near the border between the cartilaginous and osseous portions. A probe penetrated the bone in a backward direction. Percussion the same as on the 16th. There was still no evident swelling of the overlying soft parts. The discharge is said to have been less during the last week. There was as yet no pain in the ear or in the mastoid, although the patient states, on being questioned, that he has pain now and then along the sterno-cleido-mastoid. This has been present for a year past and has always been considered rheumatic.

April 25th.—Operation. Incision $\frac{1}{2}$ cm behind the line of insertion of the auricle. Skin, periosteum, and outer layers of the bone normal. The chisel does not strike pus till at a depth of $\frac{1}{2}$ cm. We cleaned out with the spoon a great cavity filled with pus, flabby granulations, and broken-down bone. This was then opened up to inspection by the removal of the undermined edges with forceps. The first phalanx of the middle finger can easily be introduced into the cavity. Tamponed with iodoform mull and permanent dressing applied. Bandages changed on May 12th (after 17 days). Perforation in the drum completely closed. Four weeks later complete closure of the wound. Hearing nearly normal.

SUMMARY.

We have to do here with a central caries of the mastoid, occurring without known cause. The painless course of the trouble is remarkable, and especially the painless starting up of an aural discharge in a man to every appearance not tubercular.

In the absence of fever, pain, and swelling, it was here the percussion of the mastoid that gave us the first certain

knowledge of a diseased focus within the bone. While percussion of both sides was regularly practised during several weeks and a normal tone always obtained, diminution of the resonance was discovered for the first time on April 16th. The fistula in the meatus which appeared later confirmed the diagnosis.

In the first case, we percussed the patient for the first time when anæsthetized and on the operating table. Here the central caries was made out chiefly from the ætiology (diabetes). The percussion was also even here of value in rendering the diagnosis certain, because the only symptom of bone disease then present, namely the periosteal swelling on the front portion of the tip of the process, was slight and only perceptible to the practised touch.

If we compare these two cases, we see that the degree of dulness corresponded to the extent of the bone disease in each case. In the first case, where there was extensive disease with only a thin shell of normal bone, we got absolute dulness; in the second, with a thicker cortical layer and a smaller carious focus, only a slight decrease.

As far as we know, the percussion of the mastoid has hitherto been employed simply to determine the sensitiveness of the bone, the percussion note not being turned to account. Michael¹ experimented in this direction, it is true, but came to a negative result, and therefore prefaced his report with these words: "Percussion of the mastoid can in no way be turned to account, because in it the resonance of the buccal cavity plays so great a part that the small amount of air in the mastoid does not come into play."

The reason which Michael assigns for the uselessness of percussion does not hold, first, because when the mouth is closed a buccal cavity does not exist, and secondly, any resonance of the buccal cavity which could influence the resonance would affect it alike on both sides, and not come into consideration when we have to do with a *difference* in the resonance on the two sides. It was his general assumption that it was the presence or absence of air, caused by a

¹ *Arch. für Ohrenh.*, Band xi., S. 46.

filling up of the air spaces with pus, which must influence the note. This is improbable on its face, because only air in large superficial bone cavities affects the bone resonance. An abnormally distended bulla-like frontal sinus can, for example, give tympanitic resonance.¹ The air in small bone cavities, on the contrary, does not affect the resonance at all. The normal frontal sinus, which contains disproportionately more air than the most pneumatic mastoid, is not tympanitic, but exactly like any other portion of the skull covered with soft parts of like thickness.

As we shall show farther on, our acceptance, *that the air consumed in the mastoid has no effect on the resonance, has been proven. The percussion sound depends much more on the resonance of the healthy or diseased bone substance itself.*

We therefore do not choose for this percussion the methods practised in examining the chest or abdomen, where we wish to test by the resonance of the air contained in the organs. In *Lücke's method of bone percussion* we seek to draw conclusions as to the condition of the bone from the resonance produced by forcible blows.²

Lücke succeeded, by means of percussion, in discovering carious foci when the soft parts were normal. This especially in the long bones. He percussed with a small hammer having a long tapering handle and its striking surface covered with rubber. In percussing the bone under examination, he constantly compared the note with that of the same point on the other side. His method gave thoroughly reliable results. It received, however, no extensive application for the following reason. The exploratory incision and chiselling, as practised to-day, are so free from danger, that surgeons do not feel the need for a means of determining a carious focus through the soft parts, when disease is probable from other symptoms.

We use a small metal hammer³ for the percussion, which

¹ Case of Zunker, *Allgemeine Zeitschrift für Psychiatrie*, 1870-71. Band xxvii., S. 43.

² Lücke, *Centralblatt für Chirurgie*, 1876, S. 673, and *Arch. für klinische Chirurgie*, 1877, xxi., 838.

³ Can be had from Dröll, Frankfurt a. M., Friedensstrasse.

must always be comparative. The striking surface is 8 mm broad and slightly convex. The handle is 16 cm long and is made of a thin tapering piece of whalebone. With this hammer, by pretty forcible, even painful percussion over normal bone covered by thin skin, a loud clear osseous tone can be obtained.

A place is to be chosen on the mastoid: (1) below the *linea temporalis*, as this line denotes approximately the upper border of the mastoid; (2) above the insertion of the tendon of the sterno-cleido-mastoid muscle, because this thickens the covering over the bone; (3) behind the border of the auricle. Should this be drawn forward to allow more room the skin would be stretched and the resonance influenced; (4) in front of the insertion of the hair.

Only a small spot, therefore, is fit for percussion.

Comparative percussion of course allows of a conclusion as to the condition of the bone only when the soft parts are unaltered.

The note will of course be affected, if, as often occurs in mastoid disease, the skin is infiltrated or raised by a subcutaneous or subperiosteal abscess, or the small lymph glands over the bone are swollen. In such cases, the above-mentioned alteration of the soft parts points to bone disease, and we do not need any other aid to diagnosis.

The following experiments show how much the condition of the soft parts affects the percussion note over the above-mentioned spot. 1. Painting one side with iodine makes the note on that side duller and softer, evidently on account of the thickening of the skin due to the hyperæmia produced by the iodine. 2. Freezing the skin with ether also lowered the resonance in consequence of alteration in the consistency of the overlying skin. 3. Painting with collo-dium has a similar effect.

We were also able to make out a decrease in the resonance in a patient who, suffering from an acute otitis media, had put a cantharides plaster behind the ear before coming under treatment. Here the diminution was due entirely to the swelling of the soft parts. The quick recovery from the middle-ear disease, and the increase in resonance accom-

panying the disappearance of the cutaneous swelling, permitted the exclusion of mastoid disease.

The cutaneous œdema caused by furuncles in the meatus also diminished the resonance.

It must be expressly stated that a one-sided perforation or accumulation of pus within the tympanum has no effect on the percussion note. Of this we have repeatedly convinced ourselves.

If, then, an alteration in the percussion note arose without any alteration in the overlying soft parts, the cause must have lain in the bone itself.

In order to determine what changes caused diminution of resonance we made several experiments on the cadaver, the results of which here briefly follow.

Experiments on Cadaver.

Body experimented on, that of a girl twenty-one years old, who had died of pulmonary tuberculosis. In removing the calvarium the cutaneous incision was carried down only to the level of the upper edge of the auricle. The skull was then sawed through perfectly symmetrically and higher up than usual, so that the aural region and the mastoid remained undisturbed.

While percussing, the skull was suspended each time at the middle of the frontal bone.

After the removal of the brain, percussion of both processes: No difference; $R = L$.

On the right side, a hole is now bored through the dura and tegmen mastoidei. Holes are then bored out in different directions from this hole, thus opening up many cavities.

These cavities are then injected with melted paraffin under strong pressure.

After the solidification of the injected mass, percussion shows no difference, resonance still $R = L$.

Process is then chiselled open from the hole drilled in tegmen. The injected mass has filled the antrum, together with the neighboring cells, the tympanic cavity, and the meatus,

Percussion : again $R = L$.

Removal of the injected mass, and opening up of the mastoid cells down to the tip, so that only a very thin outer wall remains.

Percussion: *dulness over the cavity.*

This cavity is filled with paraffin.

After solidification, percussion: *resonance again $R = L$.*

It is evident from these experiments that a filling of the air spaces in the mastoid does not affect the resonance, that on the contrary a hollowing out of the bone diminishes the resonance.

By the subsequent filling of the artificial cavity with paraffin, a solid material was substituted for the bone removed. This bone was the support to the outer wall upon which percussion was made, and when it was replaced again by solid material the cause of the dulness was thereby removed.

We are therefore justified in concluding, that, in our two cases where the observations were made on the living, it was not the filling of the cells with pus and granulations, but the caries of the bone that lowered the resonance.

Finally, we tried to imitate the carious process on the cadaver, by injecting the mastoid with concentrated hydrochloric acid. The body, however, was at our disposal but a few hours, and in this time the acid did not act perceptibly upon the bone.

In conclusion, we sum up the results of our observations and experiments in the following sentences: (1) *By means of Lücke's bone percussion it is possible to recognize a central otitis of the mastoid at a time when the disease betrays itself by no externally perceptible signs.* (2) *It is the disease of the bone itself and not the obliteration of its air spaces that alters the resonance.*

CONCERNING THE DIAGNOSTIC VALUE OF PERCUSSION OF THE MASTOID PROCESS.

By S. MOOS.

Translated by S. E. ALLEN, M.D.

I N the *Zeitschrift für Ohrenh.*, Bd. xxii., S. 234, Koerner and v. Wild have reported two cases of acute central caries of the mastoid.¹ In these cases Lücke's bone percussion rendered good service, inasmuch as both times external appearances of a mastoid trouble were absent. The lowering of the resonance of the bone made possible the early diagnosis of the trouble and the timely operative interference. Both cases were cured by the trepanning. Since then I have tested this recently advocated diagnostic method, and have arrived at the opinion that only a *positive* result is conclusive, a *negative* result not so. That is, an affection of the mastoid, and indeed even a severe one, can exist with no lessening of the resonance. This was shown by the operation on a case, in which we had to do with a trouble of one year's standing, with at first intermittent, but toward the end constant, violent pain. Here the outer surface of the mastoid was in a perfectly normal condition. Trepanning disclosed pus and bone necrosis. Irrigation after the operation brought away large sequestra.

¹ The previous article of this number, which is an unabridged translation of Koerner & Wild's paper.

REPORT ON THE TRANSACTIONS OF THE SECTION
OF OTOLOGY OF THE SIXTY-FIFTH MEETING OF
THE SOCIETY OF GERMAN NATURALISTS AND
PHYSICIANS HELD AT NUREMBERG FROM SEP-
TEMBER 11 TO SEPTEMBER 15, 1893.

BY DR. FR. BAUER, NUREMBERG.

Translated by Dr. MAX TOEPLITZ, New York.

There were present : 1. FISCHENICH, Wiesbaden. 2. Prof. BARTH, Marburg. 3. Prof. HABERMANN, Graz. 4. Lecturer LICHTENBERG, Budapest. 5. BELEITES, Halle. 6. Lecturer KAYSER, Breslau. 7. LEVY, Hagenau. 8. Lecturer BLOCH, Freiburg-i-B. 9. MAYER, Nuremberg. 10. Prof. ZAUFAL, Prague. 11. Lecturer ROHRER, Zurich. 12. DAVIDSOHN, Berlin. 13. ULRICHS, Halle. 14. ROBITZSCH, Leipzig. 15. Prof. GRADENIGO, Turin. 16. SCHUBERT, Nuremberg. 17. BAUER, Nuremberg. 18. ALDINGER, Fürth. 19. MEYERSON, Warsaw. 20. SCHEIBE, Munich. 21. JOËL, Gotha. 22. SCHMALTZ, Dresden. 23. BRÜNE, Hannover. 24. STIEL, Nuremberg. 25. Prof. HARTMANN, Berlin. 26. KOERNER, Frankfort-o-M. 27. Prof. BEZOLD, Munich. 28. HOWE, Buffalo, U. S. A. 29. THOST, Hamburg. 30. SCHULER, Wiesbaden. 31. STEINBERG, Franzensbad, San Remo.

FIRST MEETING, SEPTEMBER 11TH.

President: SCHUBERT, Nuremberg.

Secretary : BAUER, Nuremberg.

ROHRER, Zurich, reads a paper on *anomalies of formation of the auricle*.

KAYSER, Breslau, reports a case of *affection of the acoustic nerve after CO-poisoning*. The examination of the patient, a woman,

with extreme deafness and tinnitus, revealed, in addition to the normal condition of the membrana tympani, all functional signs of an affection of the sound-perceiving apparatus. Faradisation improved her rapidly. The affection was undoubtedly caused by an extravasation, analogous to other modes of action of CO. Such an isolated affection of the hearing organ in CO-poisoning has heretofore not been observed.

SECOND MEETING, SEPTEMBER 12TH.

President : ZAUFAL, Prague.

SCHEIBE, Munich, demonstrated : (1) *A fibroma of the entrance of the external auditory meatus.* (2) *An osteo-sarcoma of the external meatus.* (3) Two cases of *hairy granulation tumor of the middle ear.* The author gives in all cases the result of a careful histological examination, and demonstrates the microscopical specimens. Finally, he reports the result of the histological examination of a case of *sclerosis*, and demonstrates the specimens and drawings. The foundation of the sclerosis was in this case formed by new-formation of osseous tissue, which was confined to the surrounding of the oval window, and had produced an extensive adhesion of the stapes to the pelvis ovalis. Scheibe emphasizes the difference between sclerosis and the rare cases of chronic dry otitis media with sunken drum membrane ; in the latter the affection has undoubtedly been transferred from the Eustachian tube. He cannot give a definite explanation for the cause of new-formation of bony tissue in his case.

In the discussion, HABERMANN, Graz, mentions a new case of sclerosis, in which he has found microscopical changes analogous to those of Scheibe's case. He believes that the process originates in a chronic inflammation of the mucous membrane of the tympanic cavity.

ROHRER, Zurich, reads a paper on *perception of high and low tones in affections of the labyrinth and the n. acusticus.* He observed in certain forms of affections of the Eustachian tube and middle ear, principally in young individuals, in addition to extreme deafness for speech and loss of bone-conduction, preservation of high tones, and has described this condition as torpor of the acoustic nerve. His statistics resulted in the fact that the average age of torpor patient is below twenty-five years in sixty per cent of the

cases, and on the whole average twenty-seven years, whilst the average age in affections of the labyrinth is thirty-eight years.

In the discussion, GRADENIGO, Turin, considers the *torpor n. acustici* as *hypo-æsthesia n. acustici* of hysterical character, associated with organic lesions of the middle ear.

GRADENIGO, Turin, then discusses the *pathogenesis of otitis interna in general*. He finds in all cases of otitis interna, apart from those produced by traumatism and morbid processes in the cerebral cavity, as predisposing element a more or less marked affection of the middle ear, and indirectly of the naso-pharyngeal cavity. Two agents of etiological importance are: (1) the existence of a general hereditary or acquired infection of the organism; and (2) the hereditary disposition to aural affections. He, therefore, emphasizes principally two affections, viz., hysteria and hereditary syphilis, principally in its late forms.

LEVY, Hagenau, demonstrates the acoumeter devised by him. It serves for examination of aerial conduction, and depends upon the perception of the sound of the falling water drop, the intensity of which differs according to the altitude of the fall. The speaker, with his acoumeter, the use of which depends upon certain conditions, and is not attended to without difficulty, has made extensive examinations upon school children and prisoners, which prove the extremely sharp hearing in childhood, decreasing with advancing age, and demonstrates that isolation sharpens the hearing of prisoners.

THIRD MEETING, SEPTEMBER 12TH.

President: BARTH, Marburg.

ZAUFAL, Prague: *Contribution to the cure of otitic sinus thrombosis, with demonstration of microscopical specimens*. This was a case of extensive suppuration between dura and the bones of the skull, following otitis media purulenta without perforation. The cerebrum was punctured through the inflamed dura; exitus after two days. The post-mortem revealed extensive thrombosis of the sigmoid and transverse sinuses, the thrombus throughout organized, with purulent disintegration, as it was demonstrated from the microscopical specimens. A peculiarity of the case was the abundance of hyaline globules in the inflamed tissue of the dura, in its granulations, wellnigh 2 cm high, and in all layers of the inflamed membrana tympani,

FOURTH MEETING, SEPTEMBER 14TH.

President : GRADENIGO, Turin.

GRADENIGO, Turin : *Association of hysteria with organic diseases of the ear.* Speaker treats of organic lesions of the ear, associated with nervous symptoms, a form of symptoms which have heretofore not been particularly considered by aurists.

Apart from otalgia, which, connected with slight catarrh of the middle ear, is of most frequent occurrence, we find in hysterical individuals particularly, acoustic hypo- and hyperæsthesia, associated with hypo- and hyperæsthesia of the skin of adjoining parts, the external meatus and the auricle. They have the functional character of alteration of perception ; they differ, however, from the lesions of the labyrinth. Decrease of acuteness of hearing for high tones is about as frequent as for low tones, disturbances of equilibrium, etc., are missing. Slight inflammatory symptoms of the middle ear are always predisposing. Based upon this supposition of Gradenigo, certain seemingly paradoxical clinical observations in cases of severe or complete deafness are readily explained. A complete bibliography is given.

In the discussion BARTH, Marburg, doubts the frequency of occurrence of hysterical aural affections. Contradictions of the functional examination are frequent in lues and particularly after traumatisms, but the imperfection of the examination is frequently here at fault.

ZAUFAL, in diagnosing hysterical hardness of hearing or deafness, lays the main stress not only upon the variety of symptoms in the hearing organ, but also in other organs of sense, and generally in other organs.

GRADENIGO replied to Barth, that he considers hysterical and traumatic neuroses as being closely related conceptions.

BLOCH, Freiburg, and HABERMANN, Graz, also take part in the discussion.

BEZOLD, Munich, then makes his *preliminary communications on the examination of the pupils of the institution for the deaf and dumb at Munich.* He has examined the pupils with reference to the remaining hearing faculty, with a continuous series of tones ranging from C² with 16 vibrations to the upper limit of Galton's whistle. The extremely interesting results not being adapted to a brief review, Bezold reserves to himself to publish the conclusions deduced therefrom in another elaborate paper.

BLOCH, Freiburg, BARTH, Marburg, and GRADENIGO, Turin, discuss the paper.

BEZOLD then demonstrates the continuous series of tones in its new form, improved by Dr. EDELMANN. It consists of a series of tuning-forks, the lowest five of which are made of bell metal; the smaller ones in the middle extent of the tone scale are of steel; the series ends above with a^2 , which is followed by two whistles, covered with a lid, and by Galton's small whistle. Edelmann's improvement consists in the construction of the low tuning-forks out of bell metal, which considerably increases their manageability; furthermore, in a change of form of the sliding weights, thus obviating the disturbing sensation of cold at the ear of the examined person, produced by the vibrations of the tuning-fork; and finally in the exact denotation of the pitch upon every tuning-fork according to tones and vibratory figures at sufficiently small intervals.

In the discussion HABERMANN, Graz, mentions Appun's wire tuning-forks.

MEYERSON, Warsaw, then reads his paper on *objectively perceptible ear noises*. He divides them into entotic noises and those propagated from other organs. The former are usually of muscular origin, or they may be produced by movement of the labia of a defect of the membrana tympani. The latter are rare and of vascular origin. The author communicates two cases in which the noise was perceptible through the otoscope and through the stethoscope placed upon the skull. In the first case the diagnosis wavered between aneurysm of the internal carotid and cerebral tumor, and in consideration of the fact that compression of the common carotid permanently stayed the noise, the internal carotid was ligated. The result was negative, since the noise returned after four hours. In the second case, there existed a venous noise, which was objectively perceptible in a very anæmic patient, disappeared on pressure upon the cervical veins of the affected side, and had the character of the so-called nun-murmur.

In the discussion, BARTH, Marburg, reports the history of his own case, then FISCHENICH, Wiesbaden, and ZAUFAL, Prague, also take part.

SCHUBERT, Nuremberg, demonstrates the magnifying glass devised by him for the membrana tympani. In order to produce the greatest possible enlargement, he places the lens on the point of the aural speculum. In order to eliminate the disturbing re-

flexes, which by placing the lens obliquely is only imperfectly done, Schubert has combined a plano-convex lens with a prism, which throws the reflex far sideways and out of the field of vision. Schubert then demonstrates a series of gelatine-glycerine specimens of the ear with reference to his former publication of this method of embedding (*Arch. f. Ohrenheilk.*, vol. xxx., p. 295). He then invites the members of the section to inspect his private clinic.

FIFTH MEETING, SEPTEMBER 14TH.

(Together with Section xxi., laryngology and rhinology.)

President : ZAUFAL, Prague.

Secretary : BAUER, Nuremberg.

HARTMANN, Berlin, *demonstrates* by means of a *sciopticon*, *photographic illustrations* of specimens on the anatomical relations of the frontal sinus and its openings, then of Highmore's antrum and its entrance, pathological specimens of this cavity, new-formations and pathological specimens of the nasal cavity, anomalies of the nasal septum, and finally normal and pathological specimens of the hearing organ. Hartmann then demonstrates his apparatus, consisting of an elastic steel bow with attachment over the head for fixation of electrodes in the nose during the application of electrolysis and a number of instruments, principally scissors and cutting forceps, for the correction of deviations of the septum, and he discusses his method of partial resection of the septum.

FISCHENICH, Wiesbaden, reads a paper on *hæmatoma and primary perichondritis of the nasal septum*. In the former affection, a trauma of the nasal dorsum is of etiological importance. The diagnosis is supported, apart from the history, by the usually univocal objective result of examination or eventually by the exploratory puncture. The prognosis is also cosmetically favorable. With reference to the treatment, Fischenich, on account of his own observations, favors extensive bilateral incision with subsequent plugging. Furthermore, Fischenich reports two cases of primary perichondritis of the septum, which he had but recently observed. In the first case the original cause could not be ascertained, in the second a periostitis of the alveolar process of the upper maxilla was the cause of the nasal affection. Multiple punctures were conducive to complete recovery in both cases.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE FIRST HALF OF THE YEAR 1893.

I.—NORMAL AND PATHOLOGICAL ANATOMY, HISTOLOGY, AND PHYSIOLOGY OF THE EAR AND NASO-PHARYNX.

BY PROF. AD. BARTH, MARBURG.

Translated by Dr. MAX TOEPLITZ, New York.

A.—ANATOMY.

a.—HEARING ORGAN.

1. SCHROEDER, A. Investigations on the vascular system of the external ear. Inaugural Dissertation, Jena, 1892.
2. Prof. GRADENIGO. Malformations of the auricle. *Arch. f. Ohrenheilk.*, vol. xxxiv., p. 281, 1893.
3. VALI, E. Examinations of criminals upon morphological changes of the auricle. *Arch. f. Ohrenheilk.*, vol. xxxiv., p. 315, 1893.
4. OSTMANN. The dependence of the form of the external meatus upon the form of the skull. *Monatschr. f. Ohrenheilk.*, etc., 1893, p. 57.
5. DARKSCHEWITCH and TICHONOW. Contribution to the study of the pathologico-anatomical alterations in peripheral paralysis of the facial nerve of non-specific origin. *Neurol. Centralbl.*, 1893, p. 329.
6. AYERS, H. The peripheral relation of the acoustic nerve and the value of the hair cells of the hearing organ. *Anat. Anz.*, 1893, p. 435.
7. KREPUSKA. A case of primary tumor of the acoustic nerve with demonstration of macroscopical and microscopical specimens.

Ber. d. med. Gesellsch. at Buda-Pest, meeting of April 8, 1893.
Prag. med. Wochenschr., 1893, No. 16.

1. SCHROEDER lays the greatest stress on the excellent and instructive illustrations of his publication. The details of the description are essentially of theoretical interest.

2. GRADENIGO cites and partially illustrates his own observations of malformations of the auricle, of which he describes: absence, polyotia, præauricular appendices, and congenital fistulæ with especial reference to former publications on the subject.

3. VALI examined the abnormalities of the auricle of 500 male and 324 female criminals, and compared the results with former examinations of 1000 normal individuals. Hence follows, that in weak-minded persons, idiots, and criminals, morphological changes of the auricle occur much more frequently; that among these anomalies particularly the more important ones are more numerous; and finally, that these anomalies are among the weak-minded, idiots, and criminals of much greater frequency in males than in females of the same classes. One and the same individual also exhibits on an average more anomalies than a normal person.

4. Apart from exceptions one may assert, that the form of the calibre of the external meatus depends upon the form of the skull, so as to attribute in general the more circular meatus to the dolichocephalic skull and the longest oval meatus to the brachycephalic. The examinations were made on 2302 racial skulls.

5. The authors examined the facial nerve of a woman, aged fifty-nine, who, about a year previous to her death had been affected, in consequence of a carious-necrotic process in the middle ear, with total paralysis of all branches of the facial. Peripherally from the ganglion geniculi, parenchymatous neuritis was found; thence up to the nucleus, in the first place, the signs of secondary degeneration. The nucleus also shows marked signs of simple atrophy without indications of inflammatory process. The atrophy of the nucleus is justly considered as consequence of infectious neuritis.

6. AYERS stains according to Golgi's method and explains the superiority of his results over those of Retzius and von Gehuchten, by the superior staining of his specimens. He sums up as follows: (1) The hair cells and ganglionic cells form one morphological unity, an acoustic element, mediating between superficial and central points. (2) There exists no fundamental difference between acoustic and olfactory elements. (3) The so-called "spiral

fibres" are but short portions of radiary fibres reaching their object through a circuitous path. (4) All fibres of the acoustic, as far as it is positively ascertained, originate in the hair cells (from the centre of the base of every cell a nerve fibre arises, which, under favorable conditions, may be followed through a cell of the cochlear ganglion). (5) In the embryos of all mammals, the acoustic, during a certain stage, is formed of nerve fibres, which originate in the sauropsida organ (the later sulcus internus), and with its loss and the simultaneous development of Corti's organ, the acoustic is transferred to the latter and its composition is thereby altered.

7. This is a case of glioma of the right acoustic, which had implicated the cerebellum and internal ear.

b.—NASO-PHARYNX.

1. ONODI, A. The nasal cavity and its accessory cavities. From anatomical sections represented in twelve tables. *I. Hölder*, Vienna.

2. SPURGAT, F. The regular forms of the nasal cartilage of man when completely developed. (From the Anatom. Institute at Freiburg.) *Anat. Anzeiger*, 1893, p. 228.

3. EDINGER, L. Comparative embryological and anatomical studies of the cerebrum. 3. Olfactory apparatus and cornu Ammonis. *Anat. Anzeiger*, 1893, pp. 305-321.

4. HARTMANN, A. The anatomical relations of the frontal sinus and its orifice. *Arch. f. klin. Chirurgie*, vol. xlv., 1.

1. Every nasal cartilage is enveloped by an especial cartilaginous sheath. They are best divided into: (1) septum narium, cartilagineum, (2) tegmen narium cartilagineum, (3) annulus cartilagineus aperturæ narium, (4) cartilagine basales narium. Dispersed portions of cartilage occur in different ways, which cannot be particularly denoted. The single forms and their connection with each other are elaborately described.

3. EDINGER could prove, in lizards, blind worms, and three kinds of turtle, the presence of a genuine cornu Ammonis and its connection by means of fibres with the olfactory apparatus. He proposes to call these tracts, advancing caudally from the olfactory bulb, in the future, olfactory radiation, distinguishing the lateral and the medial radiation. In all reptiles examined, the lateral olfactory fascicle enters, reaching it from in front, the ventral

side of the cornu Ammonis. The cortical termination is thus positively proven. An elaborate description of the anatomical relations of the anterior cerebrum follows, which concludes as follows: Phylogenetically before any other nerve, the olfactory sends tracts to the higher cerebral centres. They still terminate, in fishes, in the trunk area, but rise in amphibia to the rudimentary cortex of the mantle, and meet still in amphibia a well developed formation of the cortex. This presents the characters and location of the formation of the cortical cornu Ammonis with which we are familiar in mammals. In the latter even the olfactory cortex shows unusual development and complication. We are to-day justified in the belief that the cerebral cortex is the agent of high psychical functions. It follows from the foregoing results that the phylogenetically oldest cortical action is attached to the olfactory perception. (Important for the localization of otitic abscess. H. K.)

B.—PHYSIOLOGY AND PHYSICS.

a.—HEARING ORGAN.

1. BONNIER, M. P. The tubo-tympanic functions. Note, presented by Giard. *Compt. rend. des séances de la Soc. de Biol.*, Nov. 26, 1892.

2. BONNIER, M. P. The otolithic functions. Note, *ibid.*, Feb. 18, 1893.

3. BONNIER, M. P. The otocystic functions. Note, *ibid.*, April 15, 1893.

4. CHARLESK. The localization of the hearing centre. *Brain*, 1892, p. 465.

5. CUPERUS, N. J. The upper and lower tone limits of the hearing organ. Inaugural Dissertat., Leiden, 1893.

6. GALTON, FR., and GRUBER, ED. (Jassy). Colored hearing and similar phenomena. Congress of Experimental Psychology at London, 1892 (*Rev. Neurol. Centralbl.*, 1893, p. 231).

7. KRIGER-MENZEL, O., and RAPS, A. The movement of pulled chords. *Sitzungsber. d. K. Preuss. Acad. d. Wiss.*, 1893, vol. xxix., p. 509.

1, 2, 3. Description of the manner in which the Eustachian tube, the tympanum, otoliths, and otocysts assist in the function of the apparatus of equilibrium.

5. After an historical synopsis, CUPERUS gives his own investigations upon the upper and lower tone limits, which he had studied in 109 entirely normal hearing organs. The lower limit was searched with an Appun's lamella, the upper limit by means of Galton's small whistle, after having determined the pitch according to the method of van der Plaats and Zwaardemaker. Cuperus ascertained that from childhood to old age (over eighty years) the upper limit of hearing decreases a fifth, and the lower limit rises a sixth. The extent of our tone hearing is thus shortened by more than an octave. The absolute boundary line of the earliest childhood, according to the author, is above approximately at e^7 , below at D with nine vibrations or E with ten vibrations. All these results are derived from average figures.

ZWAARDEMAKER.

6. These are psychical phenomena, which, in some artists, seem to be particularly well developed, and depend upon simultaneous excitation of one sensory sensation during the excitation of another organ of sense. GRUBER'S investigations ascertained two types of double sensation: (1) such individuals who, in a measure, hallucinate a secondary color perception additionally to the auditory perception, and whose color picture does not always correspond with the auditory impression, but changes; and (2) who, in a measure, associate the same color ideas with the same tone perception. It is left undecided whether these phenomena are more of a pathological than a physiological character.

7. The authors, after having formerly photographed and investigated the course of time of the movement of a point of a vibrating (stricken) chord, applied the same method to the movement of pulled strings. The theoretical propositions were essentially confirmed by the results.

b.—NASO-PHARYNX.

1. SAVELIEFF, N. Examination of the sense of smell for clinical purposes. *Neurol. Centralbl.*, 1893, p. 340.

2. RÉTHI. The nerve roots of the pharyngeal and palatal muscles. (From the Wien. Physiol. Instit.) *Sitzungsber. d. Kais. Acad. d. Wiss.*, in Wien, 1892, vol. cl., part III.; *Rev. Neurol. Centralbl.*, 1893, p. 268.

1. Among the substances examined, oleum juniperi and oleum

menthæ piper. exhibited the strongest intensity. The limit of perception for both is at an attenuation of from 1 to 64,000,000.

2. The glosso-pharyngeo-vagus and accessorius arise in three fascicles from the medulla oblongata. In the upper fascicle the motor fibres for the m. stylopharyngeus and principally the motor fibres supplied by the n. laryngeus medius take their course. The middle fascicle supplies the constrictors of the pharynx, also the levator veli palatini, palato-pharyngeus, and palato-glossus. The motor fibres of the tensor palati molliis originate in the motor root of the fifth. The facial does not participate in the innervation of the muscles of the pharynx.

II.—PATHOLOGY AND THERAPEUTICS.

BY DR. ARTHUR HARTMANN, BERLIN.

Translated by Dr. MAX TOEPLITZ, New York.

GENERAL LITERATURE.

1. Prof. K. BÜRKNER. Report on the cases observed at the polyclinic for aural diseases at Gottingen during the stated periods 1890-91 and 1891-92. *Arch. f. Ohrenheilk.*, vol. xxiv., p. 241.

2. GRAZZI, V. Old and new reasons for the consideration of otology and laryngology in the university programmes. *Bollet. delle malattie dell' orecchio*, etc., No. 2, 1893.

3. LINSMAYER, LUDWIG. Intense subjective aural noises. Ligature of the right internal carotid. Death from hemiplegia and pneumonia after five days. *Wien med. Blätter*, Nos. 8 and 9, 1893.

4. CHAUVEL. Traumatism in the etiology of affections of the hearing apparatus. *Arch. Intern. Laryng., Rhinol. and Otol.*, No. 3, 1893.

5. Prof. I. BÖKE (Budapest). Syphilitic affections of the hearing organ. *Wiener Allgem. Zeitung*, No. 2, 1893.

6. ROBINSON, J. R. Functional deafness and destruction of the membrana tympani, caused by an electric shock while using a telephone. *Annals of Ophthalm. and Otol.*, January, 1893.

1. BÜRKNER treated 2357 patients, 44.4 per cent. of which were children, 55.6 per cent. adults; 66.3 per cent. of the latter

were males. The ossicles were excised in six cases, among which were three with permanent result. Among the new remedies, bichloride of iodine was tried for injections in solutions of $\frac{1}{2}$ per cent. and was found beneficial, particularly in fistulæ of the upper part of the membrana tympani, and in cases of caries with large perforations. Lysol, naphthol, peroxide of hydrogen, and, last but not least, pyoktanin were not found satisfactory.

RUMLER.

2. In the introductory lecture of his academical course GRAZZI discusses, in addition to otology and laryngology, particularly the importance of rhinology.

GRADENIGO.

3. LINSMAYER's patient, aged sixty-five, with stenosis of the ostium aortæ and of the aorta due to atheromatous processes, suffered for thirty-five years from moderate deafness and tinnitus in consequence of sclerosing otitis media. Suddenly, without any apparent cause, there developed, together with palpitation and asthma, an intense noise in both ears, which now became permanent during the entire last year and disturbed his sleep, work, and thoughts. In addition he heard "voices," advising him to commit suicide. Otological examination revealed complete deafness in the right ear, and perception of very loud words in the left. By Weber's experiment the tuning-fork was better perceived in the right ear. Rinné was missing in both ears. Pressure upon both carotids immediately caused vertigo and interfered with consciousness. Ligation of the right internal carotid not only did not remove the subjective noises, but produced within five days hemiplegia with hemianopsia of the left side and complete deafness of the left ear, another additional evidence for the crossing of the acoustic nerves.

POLLAK.

4. Among 1470 observations made at the otological department of the Hospital Val de Grâce CHAUVEL found in 108 traumatism to be the cause of diseases of the hearing organ. He distinguishes between indirect traumatism: report of cannons and guns, explosions, whistles, douches, diving (34 cases, or 32.3 per cent.), and direct traumatism: knock on the head, fall on the head, and fracture of skull, falls (71 cases, or 77.7 per cent.)

GELLÉ.

5. BÖKE reports: 1. A case of otitis media, with thickening, formation of a pseudo-membrane, and secondary affection of the labyrinth, cured by injections of pilocarpine. 2. A case of large

condylomata in the external meatus and upon the auricle, cured by antiluetic treatment. POLLAK.

6. ROBINSON reports the interesting accident of a man who, while using the telephone, received a shock of lightning through the instrument. He fell down unconscious, and the corresponding side (left) was benumbed. Hearing $\frac{9}{32}$. Ragged rupture of the membrana tympani and swelling of the mucous membrane of the drum cavity. A C tuning-fork can be heard at $\frac{1}{2}$ inch by air, and less distinctly by bone-conduction. Senses of taste and smell impaired. Thirteen months after the the injury hearing was restored to $\frac{12}{8}$, and the rupture in the membrana tympani was healed. SWAN M. BURNETT.

INSTRUMENTS AND METHODS OF EXAMINATION.

7. LABIT, G. The diagnosis of aural affections by means of the tuning-fork. Paris, 1893.

8. WINKLER, ERNST, Bremen. The use of dilating sounds in nasal surgery. *Monatsschr. f. Ohrenheilk.*, No. 6, 1893.

9. DESSAR, Leonard A. A new nasal bougie. *Med. Rec.*, April 8, 1893.

10. BERMINGHAM, Edward J. The adaptation of the Edison current to the galvano-cautery. *N. Y. Med. Journ.*, February 4, 1893.

11. TEETS, Charles E. Nasal punch-cutting forceps. *Med. Rec.*, February 11, 1893.

12. MAJOR, Geo. W. Nasal septum knives. *N. Y. Med. Journ.*, April 8, 1893.

13. ANCRUM, John L. Combined tonsillitome and uvulatome. *Med. News*, January 7, 1893.

14. BAUMGARTEN, EGMONT. Gütcher's thermo-electric battery for the filling of storage cells. *Monatsschrift f. Ohrenheilk.*, 1893, No. 5.

7. LABIT gives a careful and elaborate description of all methods of hearing examination with special reference to the examination with tuning-forks. He quotes the different authorities of this branch and reviews the different views still under discussion. He has tabulated his observations upon examination with tuning-forks with special reference to Rinne's experiment. He arrives at the following conclusions: 1. For examination of

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hearing, all methods of examination, particularly the examination with tuning-forks, should be used. 2. Weber's and Rinne's experiments are of diagnostic value. 3. If Weber's and Rinne's experiments do not suffice for the establishment of the diagnosis, or give opposite results, other methods should be used; if they harmonize, the diagnosis is established. BOK.

8. WINKLER uses metal plates with handles, from 7 to 9 *cm* long, from 1.0 to 1.4 *cm* wide, and from 1 to 5 *mm* thick, in order to push aside swellings of the lower turbinated body during rhinoscopia anterior and for the prevention and cure of synechiæ. They did excellent service also in a case of partial osseous occlusion of the left choana. KILLIAN.

9. The instrument is made of vulcanized rubber and is one eighth of an inch thick, four inches long, and three eighths of an inch wide. It tapers to a thin rounded edge and at the other end is provided with a rounded handle with depressions for the thumb and forefinger. It is used for the prevention of, as well as for rupturing, adhesions. Messrs. Tiemann & Co. are the makers of the instrument. M. TOEPLITZ.

10. BIRMINGHAM uses the Edison current for galvano-cautery operations. His rheostat is made of No. 14 iron wire forming a coil of one and a quarter of an inch in diameter and of fifty feet in length. He employs No. 8 copper wire to connect the rheostat with the underground cables, and No. 14 flexible cords, double, for each conducting rod to connect the rheostat with the cautery handle. The latter is a closed circuit handle, thus obviating the production of an arc. M. TOEPLITZ.

11. The forceps has small teeth along the sides of the lower jaw and two small pins in the centre of the upper jaw, to prevent the forceps from slipping, particularly in the act of removing the ridge from the septum. M. TOEPLITZ.

12. The instruments are hooked knives (rights and lefts) with chisel edge and bent at the distal end, so as to secure a good hold on the posterior edge of the growth. They are inserted into a universal handle and vary in size, shape, and curvature. The instrument is to be used in cases of spurs or crests, when the saw cannot be manipulated. For hard growths the saw is preferable. M. TOEPLITZ.

13. The instrument has a concealed spring within the rubber handle. The knife closes the spring by pressure upon the bulb and is held by an automatic catch. The dart is pushed down by

14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

the thumb-piece, and, in moving, releases the catch, so as to allow the knife to fly instantaneously upward. For the uvulatome a metal disc is slid upon the dart carrying it forward to hold the uvula, which is cut off in the same manner as the tonsil. The instrument is made by Messrs. Tiemann & Co. M. TOEPLITZ.

14. These thermic elements do not require especial attention; they use up a small amount of gas and are so well adapted for filling storage cells as to deserve the high recommendation of Baumgarten, who has used them for a year and a half.

KILLIAN.

EXTERNAL EAR.

15. CHATELLIER. Treatment of eczema of the ear. *Arch. Internat. Laryng.*, etc., No. 4, 1893.

16. MENDEL. Tertiary syphilis of the external ear. *Annal. des mal. de l'oreille*, etc., No. 5, 1893.

17. HECKE, Breslau. Operative removal of exostosis of the right external auditory meatus. *Deutsch. med. Wochenschr.*, No. 23, 1893.

18. ALDERTON, Henry A. Seborrhœic affections of the external ear. *N. Y. Eye and Ear Infirmary Reports*, January, 1893.

15. Iodol, finely powdered, is the efficacious drug. In dry eczema, the external meatus is carefully cleansed with Van Swieten's fluid, then dried and filled with iodol-paraffin oil in solutions of 1 to 30. In moist eczema the external meatus is filled after syringing with powdered iodol. GELLÉ.

16. The patient, aged eighty-four, female, was infected April, 1891, treated October, 1892, and admitted into the hospital January, 1893. Both auricles form the seat of nodulous, squamous, well-nigh confluent, infiltrated, syphilitic ulcers, which were immediately covered with thick and wide crusts. From the first day intense pain was felt in the left ear, and also thick, green, profuse discharge. Injections and lukewarm instillations of iodoformed glycerine were ordered. The auricles soon became clean, the membranæ tympani quite hyperæmic. On March 14th the patient was discharged from the hospital. GELLÉ.

17. The exostosis completely filling the entire external meatus, led by retention of pus gathering in the tympanic cavity, to dangerous symptoms, and was, therefore, removed with the chisel after ablation of the auricle. On account of simultaneous caries,

the mastoid antrum was opened and, by removal of the posterior wall of the external meatus, turned into a flat fossa.

NOLTENIUS.

18. ALDERTON treats of seborrhœic affections of the ear under the heads of: 1, seborrhœa oleosa; 2, seborrhœa sicca; 3, comedo; 4, sebaceous cysts; 5, sebaceous adenomata. Several drawings are given of sebaceous cysts of the auricle and canal.

SWAN M. BURNETT.

MIDDLE EAR.

19. ROBERTS, N. S. Pyoktanin in ear disease. *N. Y. Med. Record*, January 28, 1893.

20. BRAISLIN, WM. C. Otitis media purulenta, following an amputation of the uvula. *N. Y. Med. Journ.*, March 4, 1893.

21. WILSON, HAROLD. Vibratory massage of the middle ear by means of the telephone. *N. Y. Med. Journ.*, Feb. 25, 1893.

22. HEWETT, JAMES. Adenoid growths as a cause of ear disease in children. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1893.

23. BING, Vienna. Contribution to the treatment of inflammation of the mastoid portion of the petrous bone in otitis media. *Centralb. f. Therapie*, June, 1893.

24. BRUNNER, G. Experience in otology. *Correspondenzblatt für Schweizer Aerzte*, 1893, p. 161.

25. BONNIER. Bilious otorrhœa. *Soc. laryng. de Paris*, 4, x., 1892.

26. FERRERI. Caries necrotica and formation of sequestra in the petrous bone of children. *Archivio Ital. di Otologia*, etc., i., p. 201.

27. SEXTON, SAMUEL. Remarks on otosclerectomy and otonecromectomy. *Med. Record*.

28. DENCH, E. B. Operative measures for the relief of chronic suppurative and non-suppurative inflammation of the tympanum, the indications for the employment of such measures, and the results obtained. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1893.

29. FRIEDENWALD, HENRY. Cholesteatoma of the ear. *Med. News*, March 11, 1893.

30. ADAMS, JOHN L. Report of fifteen cases of mastoiditis treated at the N. Y. Eye and Ear Infirmary, during the period

from March, 1892, to September, 1892. *N. Y. Eye and Ear Infirmary Reports*, Jan., 1893.

31. Prof. E. DE ROSSI, Rome. Surgery of the middle ear. *Ibid.*, p. 105.

32. PANSE. Stacke's method of operation for the opening of the middle ear, during the first year of its use at the aural clinic at Halle. *Arch. f. Ohrenheilk.*, xxxiv., p. 248.

33. SIEBENMANN, Bâle. The radical operation for cholesteatoma by wide permanent openings, simultaneously toward the external meatus and the retro-auricular region. *Berl. klin. Wochenschr.*, Nos. 1 and 2, 1893.

34. GRUNERT. Aural cholesteatoma, a paper written to supplement that of Prof. Siebenmann, of Bâle, on the radical operation of cholesteatoma. *Ibid.*, No. 14, 1893.

35. MAUREL, M. PIERRE. Opening of the tympanic cavity according to Küster's Method. *Revue de laryng.*, etc., No. 5. 1893.

36. MARCHAND, GÉRARD. The septico-pyæmic complications in otitis. *Semaine Méd.*, June 28, 1893.

37. EULENSTEIN, Frankfort-on-the-Main. Pyæmic metastases in acute affections of the temporal bone. *Monatsschr. f. Ohrenheilk.*, No. 6, 1893.

38. BIRCHER, H. Phlebitis of the lateral, inferior petrosal, and cavernous sinuses. Opening and disinfection after removal of the pyramid of the temporal bone. Recovery. *Centralbl. f. Chirurgie*, No. 22, 1893.

39. PRITCHARD, URBAN, and CHEATLE, LENTHAL. Pyæmic thrombosis. Operation. *Lancet*, March 4, 1893.

40. KOSSEL, H. A case of tuberculous caries of the petrous bone, with sinus thrombosis and consequent development of general miliary tuberculosis. *Charité-Annalen.*, vol. 137.

41. LANZ, O. A case of deep-seated cerebral abscess. *Correspondenzblatt für Schweizer Aerzte*, pp. 129 and 166, 1893.

42. KIRCHNER, Würzburg. A case of purulent meningitis after otitis media with rapid exitus letalis. *Berl. klin. Wochenschrift*, No. 23, 1893.

19. After a fair trial, ROBERTS concludes that pyoktanin has no advantages over any of the commonly used remedies in ear diseases.

SWAN M. BURNETT.

20. In the case related by BRAISLIN, he thinks there may be a connection between a purulent otitis media, which appeared in a consumptive some days after the amputation of the uvula to relieve a cough, and the operation. SWAN M. BURNETT.

21. WILSON has made use of the hand telephone of Bell, connected with a Faradic current, and so arranged as to give vibrations from the softest to the very loudest, as a method of massage in middle-ear disease, and in the four cases which he reports there was no benefit except some diminution in the tinnitus. For the purposes of massage he considers this method superior to Maloney's otophone or the phonograph.

SWAN M. BURNETT.

22. HEWETT thinks that, in the majority of cases of middle-ear disease of all kinds in children, an examination will reveal the presence of adenoid disease which acts as chief cause in their production.

SWAN M. BURNETT.

23. BING, in the treatment of otitis media, mainly emphasizes, for the prevention of its extension into the mastoid cells, strict antiphlogosis from the beginning of otitis until the acme is passed. Early mastoid operation is pleaded only in dyscrasic individuals with presumably pneumatic mastoid processes, whilst diploëtic ones are not operated upon, unless urged by extreme pain and continuous high fever.

POLLAK.

24. In the paper written for the general practitioner, BRUNNER argues also against polypragmaty in otitis media purulenta acuta, and against the unfortunate attempts at "harmonizing" its treatment with bacteriological investigations. Furthermore, the author's advice on the necessity of absolute rest, either by confinement to the room or even to the bed, is indeed worthy of recommendation. In acute, as well as in chronic suppurative otitis media, Brunner uses zinc. sulfuric. as "an old efficacious remedy," and also boric acid. We emphasize also Brunner's frequent observation of transition of marked catarrh of the middle ear (mostly with naso-pharyngeal catarrh) into pronounced sclerosis in the course of time.

SIEBENMANN.

25. A cirrhotic patient was affected with otitis. The character of the otorrhœa changed with the icterus. At the onset, the suppuration hardly exhibited a greenish tint, but the aural discharge became greener according to the increase of the green hue in other secretions (sputum, tears, nasal mucus). During agony, the icterus disappeared and withal, the otorrhœa appeared yellow, thick without the green hue.

GELLÉ.

26. FERRERI reports two cases of labyrinth necrosis, and discusses the result of his histological investigations in caries of the temporal bone. According to the author it is quite probable that the caries begins with the development of the affection of the soft parts. He finally recommends the use of a ten per cent solution of chlor. zinc, to be applied with a cotton pellet to the affected bone. Six observations prove the efficacy of the remedy.

GRADENIGO.

27. SEXTON in this short paper simply reiterates his belief in the usefulness of removing the ossicles, not only when necrotic, but also for the relief of the troublesome symptoms of sclerosing catarrh of the middle ear.

SWAN M. BURNETT.

28. DENCH reports the results of 24 cases of chronic suppurative otitis operated on by removal of the ossicles. In 14 the discharge was stopped, in 8 much reduced, 2 are still under observation. In 14 the hearing was improved, in 9 it remained the same and in one was apparently reduced. In 6 cases the malleus alone was removed; the malleus and incus in 11 cases, and the three ossicles in 3. In 2 cases all the ossicles had been destroyed. Nine operations were made on an intact membrane. In these the hearing was greatly improved in 4 cases, slightly in 4, and not in 1. A clear description of the method of operating is given which is too elaborate for abstraction. The instruments used are figured. He carefully examines the relation between air- and bone-conduction, and considers this as furnishing important information as to the indication for an operation. He uses a series of forks from 128 to 2048 vibrations devised by A. Hartmann, and considers evidence found by this examination showing involvement of the nervous apparatus as contra-indicating the operation in a greater or less degree for the purpose of improving the hearing. He deems the removal of the ossicles often indicated for drainage effect. He has found operating on one ear to be followed by an improvement in the hearing power in the other so often that he can not regard it as a mere coincidence.

SWAN M. BURNETT.

29. FRIEDENWALD here relates the histories of three cases of excessive epithelial formation in the middle ear in addition to the one already reported in these Archives vol. xx. In one there was a serious complication of mastoid disease which necessitated an opening of the bone.

SWAN M. BURNETT.

30. Of the fifteen cases detailed by ADAMS twelve were operated upon and three were treated with the Leiter coil. The

indications for operation are pain and tenderness over the mastoid not due to inflammation of the external auditory canal. The operation was always performed behind the auricle and never through the auditory canal. The mallet and chisel were used for making or enlarging the opening. Fourteen cases recovered and one died. The discharge ceased in all but two after the fourth day, and in these two after the sixth day.

SWAN M. BURNETT.

31. On account of five cases, in which the extraction of the carious malleus cured the otorrhœa as well as other severe subjective symptoms and also improved the hearing, DE ROSSI gives a brief historical summary and discusses the indications of the operation. He reminds of the fact that, at the clinic of Rome, the disarticulation of the incus from the stapes and the luxation of the latter have been performed ever since 1876. For the diagnosis of the mobility of the stapes neither Bing's (entotic hearing through the catheter) nor Schwartze's method (exploratory opening) are sufficient. For the diagnosis of ankylosis between malleus and incus the wellnigh normal position of the malleus within a large perforation appears to be a good criterion; if the malleus is movable, it is much retracted, touching the promontory. Furthermore, DE ROSSI gives the description and illustrations of numerous carious processes of the ossicles, and, finally, he discusses elaborately the different operative procedures, describing and illustrating the instruments used by him. GRADENIGO.

32. At the clinic at Halle sixty-nine cases were operated according to Stacke's method, which, however, had to be modified. The cutaneous incision was not extended so far forward, in order to avoid the formation of sequestra and a lower position of the auricle. "The further progress of the operation has been changed, inasmuch as, after eleven openings of the attic for the cure of chronic suppuration with but two temporary recoveries, at first, as a rule, we now make the typical opening of the antrum according to Schwartze, as has also been advised by Stacke, whence we proceed further. It is but rarely possible to ascertain the condition of the antrum by probing, and to delineate the further operation accordingly." The cutaneous wall of the external meatus is not pulled out, but the posterior wall is bluntly detached, and by a long, rectangular blunt hook pushed against the anterior wall. In some cases the meatus, when operated upon according to Stacke's proposition, sloughed. Removal of the

posterior wall of the meatus produced temporary paralysis of the facial in five cases. The instrument for the protection of the stapes was not used. In some cases PANSE has formed the cutaneous flap of the external meatus differently from Stacke, in order to avoid the implantation of the flap upon the freshly opened spongiosa, forming a flap by two parallel incisions posteriorly above and posteriorly below, the subperiosteal connective tissue of the quadrangular flap being stitched to the same tissue of the external soft parts. The after-treatment is then made only through the funnel. "The advantage consists in the tendency of the epidermis to more rapid extension on account of the healthy and well-nourished foundation and the sparing of the artery running along the cutaneous posterior wall of the meatus, and the patient may remain without dressing from the eighth day, when the wound is firmly closed." For after-treatment irrigations or powdered iodoform were used. Plugging should be carefully done. Among fifty-seven radical operations there occurred thirty-one recoveries. The paper is concluded by the histories of the cases.

RUMLER.

33. Relapses of suppurations in extensively opened cholesteatomatous and carefully irrigated cavities are due to irritation from putrified products of maceration. Establishment of free aërial ventilation by removal of the entire anterior and lateral wall of the cholesteatomatous cavity and permanent exposure of these defects are the best means of preventing lasting soakage of their walls and of producing resistant epidermisation. SIEBENMANN achieved this result by chiselling off the posterior wall of the meatus according to Zaufal-Stacke, by making the retro-auricular osseous opening as large as possible, and by lining the latter with cutis by means of a postero-superior flap (Schwartz), of transplantation of Stacke's flap from the external meatus, and of carefully stitching the wound of the auricle. Further defects in small cavities with thick corticalis are covered with Thiersch's transplantations when the granulations appear. The healing takes on an average of from one to one and a half months. The full description of the method of operations and of the after-treatment should be read in the original.

SIEBENMANN.

34. GRUNERT argues against Siebenmann first defining the views prevalent at the clinic of Halle on cholesteatoma, which he considers as a secondary complication of chronic otorrhœa. The intertrigo-like irritation of the epidermoid investment of the

cholesteatomatous cavity has also been observed at Halle. The relapse, however, is not caused thereby, since the cholesteatomatous pearls become purulent from the centre without a trace of pus in the peripheric layers and upon the walls of the cholesteatomatous cavity. Eczema of the wall develops secondarily from the retained disintegrated secretions. According to the experience of the clinic at Halle in approximately 200 operated cases of cholesteatoma, the complication with caries is much more frequent as is stated by SIEBENMANN. The favorable influence of the access of air has also been observed, but it by no means prevents relapses, since the lining of the cavity presents chronic desquamative inflammation, continuously leading to the shedding of epidermis in lamellæ and its purulent disintegration. Grunert then claims for Schwartze the priority of the idea of permanent exposure of cholesteatomatous cavities. The method of operation is then fully discussed, without necessarily requiring careful sewing of the border of the auricle; transplantations according to Thiersch are superfluous, since the cavity exhibits a marked tendency to epidermisation. The cholesteatomatous cavity becomes not infrequently dry in six weeks also at Halle, but without complete recovery, a return of typical cholesteatoma after months and years not being excluded.

RUMLER.

35. This is a case of chronic purulent otitis media, with formation of cholesteatomatous masses, after previous unsuccessful removal of the ossicles and subsequent opening of the mastoid process. The combination of the above mentioned symptoms and the appearance of meningitic symptoms led to the operation according to Küster (?), which is very carefully described by the author, consisting in opening of the mastoid process with removal of the posterior and upper wall of the external auditory meatus. The alarming phenomena disappeared and the success of the operation cannot be doubted. The use of electric illumination is recommended in such operations.

BOK.

36. Twenty days after the appearance of suppuration of the left ear, signs of depression and ptosis of the right eye appear, meningitic symptoms then arise (enlargement of the pupils, spontaneous vomiting, rigidity of the nape of the neck), with paralysis of the left facial. On account of diagnosis of cerebral abscess, MARCHAND opens the mastoid antrum without result; he then trephines the skull, in the supposition of an abscess in the middle cerebral fossa, and punctures without finding pus. The patient

dies. The post-mortem reveals : (1), the petrous bone and the dura mater to be entirely intact ; (2), meningitis acuta suppurativa diffusa, with foci of pus at the different parts of both hemispheres ; (3), complete absence of visceral lesions. The author arrives at the conclusion that, in this case, the otitis was the point of issue of a general inflection to which the meningitis was secondary. This case forms an addition to those of Moos, Netter, Zaufal, Chauvel, and Réclus.

GELLÉ.

37. Collation of original and reviewed statements on pyæmia, in acute affections of the middle ear and petrous bone, published in the *Archiv für Ohrenheilkunde*, results, according to EULENSTEIN, in the fact that sinus-thromboses are frequently (eleven times among twenty-four cases) missing, that chills occur mostly in the appearance of metastases, that metastases develop principally in the joints (ten times) and in the lungs and pleuræ (eight times), and that one half of the cases of pyæmia die, whilst the other half recover. In a case observed by Eulenstein, the acute suppuration of the tympanic cavity did not affect the antrum, but advanced directly toward the sinus, which bled during the operation. Metastases in the right sterno-clavicular and in the joints of the foot were treated with drainage. The result was favorable after six weeks. The diseased joints and the ear healed. The foot regained its full use, and the hearing power became normal.

KILLIAN.

38. The patient, a female, aged twenty-five, exhibited bilateral otorrhœa for five years, due to scarlatina. The left mastoid process, on account of acute inflammation, had been opened, September, 1892, and a large cavity, filled with fetid pus, was laid open toward the lateral sinus. Since the fever and other general symptoms did not abate, and paralysis of the n. oculomotorius, n. trochlearis, and neuralgia of the fifth, the middle cerebral fossa was opened, and the greatest part of the petrous bone up to its apex was removed subdurally piecemeal. The removed bone was found to be unaltered, but the sinus petrosus inferior, which was thus exposed, contained fetid pus. After the operation, headache and fever immediately disappeared, and the function of the oculomotory and trochlear nerves returned inasmuch as the movements of the eyeball were reduced to one half of the normal excursions. The facial, destroyed by operation, remained paralyzed.

SIEBENMANN.

39. URBAN PRITCHARD and LENTHAL CHEATLE give a care-

ful description of opening of the lateral sinus and the jugular vein in a case of pyæmic thrombosis due to otitis (see paper, this volume, p. 24).

40. The patient, a smith, aged twenty-eight, was admitted on account of pulmonary tuberculosis into the patients' ward of the institution for infectious diseases. After continuous rise of temperature up to 39° and more, discharge from the right ear appears. A few days later the patient complains of intense headache, whereupon loss of consciousness, deliria, high temperature, and accelerated pulse suddenly set in. On the following day the sensorium was free, but the temperature rose every evening, the lungs presented general small crepitant râles, the strength was gradually sinking, and, twenty-six days subsequently to the sudden onset of loss of consciousness, death ensued. At the autopsy, the upper lobes exhibited old tubercular lesions, the other parts of the lungs, the spleen, liver, and kidneys, densely crowded with miliary tubercles. In the intestines there was found an old ring-shaped tubercular ulcer near the ileo-cæcal region. In the walls of the pulmonary veins and in the thoracic duct, no tubercular changes were found. In the cerebral cavity, the right lateral sinus contained a thrombus, consisting of yellow, brittle masses. It extended into the jugular vein, and adhered to the wall of the sinus. In the centre of the sigmoid fossa, the wall of the sinus was situated directly over a carious region in the adjoining portion of the petrous bone, communicating with the tympanic cavity. The latter was filled with offensive pus, and the membrana tympani was perforated. In the suppuration of the middle ear, tubercle bacilli and also streptococci and bacillus pyocyaneus were found. *The thrombus contained tubercle bacilli in enormous quantities* apart from the bacteria found in the suppuration of the tympanic cavity. In this case, tubercular caries of the middle ear had probably existed for a long time in addition to the tuberculous affection of the lung. The caries had gradually implicated parts of the petrous bone adjoining the lateral sinus, and the tubercle bacilli, after invasion and destruction of the bone, had caused tubercular affection of the wall of the sinus and finally thrombosis. In the thrombus itself they had apparently found a favorable nutrient soil, and from loosened particles they were thrown into the circulation. It is remarkable that pyæmia, which is otherwise the usual consequence of septic thrombosis of the sinus, did not develop, inasmuch as the thrombus contains

an abundance of pyogenic bacteria in addition to the tubercle bacilli. (AUTOREVIEW.)

41. LANZ, at the surgical clinic at Berne, had, during the last two years, the opportunity of observing three cases of deep-seated cerebral abscesses, two of which followed suppurations of the middle ear. The last of these cases is well illustrated by an elaborate history with very instructive epicritical remarks. It concerned a man, aged twenty-three, who had since the fifth year of age, suffered (after scarlatina) from chronic otorrhœa, and was suddenly seized with chills, headaches, and earaches. Dulness of sensorium, choked disk, and retardation of pulse were later additions. Prof. Kocher opened the antrum by chiselling, but found little pus and the sinus normal; after opening, however, of the middle cerebral fossa up to the region of the upper temporal convolutions, the dura was there found to be slightly discolored at a circumscribed place. Paracentesis of the cerebrum at this place, with subsequent blunt enlargement of the exploratory canal, discharged, from the depth of from 1 to 2 cm, fetid pus to the amount of at least 100 ccm. During the following days the sensorium became more free and the temperature normal; but subcortical verbal alexia appeared, characterized by the loss of the faculty of reading and writing, whilst the faculty of copying was preserved and the speech of sounds completely intact. Five or six weeks after the operation fever suddenly reappeared and the patient died on the following day under dyspnoëtic symptoms. At the autopsy there was found near the scar resulting from the opening of the cerebral abscess, another encapsuled superficial abscess of the size of a pigeon's egg.

SIEBENMANN.

42. A soldier presents himself with complaints of tinnitus and pain in the right ear. "The membrana tympani appeared dull and somewhat bulging in the postero-inferior portion; the hearing power was somewhat decreased."

On account of the apparent mildness of the affection the man was treated as an out-door patient. In the evening fever set in, toward the following morning loss of consciousness, restlessness, grinding of teeth, and vomiting. Treatment: Ice-bag upon the head, deep longitudinal incision, according to Wilde, into the right mastoid process, and calomel internally. Death the same afternoon, thirty-two hours after the first presentation. After opening of the skull a fresh, purulent meningitis was found.

"Thickening and dulness of the dura mater around the right porus acusticus internus were noteworthy. The tympanic cavity and labyrinth were completely filled with pus, the membrana tympani was dull and markedly thickened. The purulent contents were visibly thickened, comparatively devoid of fresh cells; they contained, however, many cholestearine crystals and flattened cellular structures, somewhat similar to 'pearl-nodules.' The mastoid cells were found to be intact." Bacteriological examination of the pus revealed the presence of staphylococcus pyogenes aureus, and staphylococcus pyogenes citreus, but absence of Fraenkel's capsule bacillus.

RUMLER.

NERVOUS APPARATUS.

43. GRADENIGO, G. Aural phenomena in hysteria. *Arch. Ital. di Otol.*, etc., vol. i., pp. 166 and 256.

44. GRADENIGO, G. A case of probable inflammation of the acoustic nerve after influenza. *Allgem. Wien. med. Zeit.*, No. 4 and 5, 1893.

45. BABER, CRESWELL. Auditory nerve deafness. *Brit. Med. Journ.*, Feb. 25, 1893.

46. TOOTH, HOWARD. Absolute deafness associated with diphtheritic paralysis. *Ibid.*, March 11, 1893.

47. LEVA, I. Contribution to the localization of aphasia. (From the medical clinic of Prof. Dr. Eichhorst of Zurich.) *Virchow's Arch.*, vol. cxxxii., No. 2.

43. Of GRADENIGO's paper but that part has heretofore been published which refers generally to the hysterical phenomena of the ear and to acoustic anæsthesia as partial phenomenon of general hemianæsthesia. Gradenigo mentions that the latest publications on hysteria hardly allude to the phenomena arising from the ear, and that but a few text-books of otology contain a brief chapter on hysterical deafness. He attempts to demonstrate that aural phenomena are of comparatively frequent occurrence in hysteria, and that their exact knowledge not only enables the aurist to define precisely the prognosis and treatment of a large number of cases of deafness, but also gives the neurologist a new diagnostic sign through the result of aural examination.

GRADENIGO.

44. The diagnosis depends upon the result of the functional examination. The perception of the high notes (c^4c^5) is well

preserved, whilst there exists a defect of the middle notes, principally *c*¹. The functional exhaustion develops rapidly and excessively, so as to render the acuteness of hearing in the tired ear considerably smaller than in the untired one. Electrical irritability is also excessively increased. POLLAK.

45. CRESWELL BABER reports a case of nervous deafness in which treatment with pilocarpine seemed to have rendered good service. The nervous deafness was associated with otitis media.

46. In the case reported by TOOTH complete deafness occurred a month after admission to the hospital when the diphtheritic inflammation had entirely disappeared. The deafness vanished with the cessation of the paralytic symptoms. Tooth deems the diagnosis of a central affection to be more probable than that of an affection of the acoustic nerve.

47. LEVA, analyzing the cases observed during the last ten years at Eichhorst's clinic, furnishes a very valuable contribution to this important subject. His instructive paper follows the synopsis given by Naunyn in 1887 on the localization of the aphasic disturbances, in which, by simple tabulating, the cortical fields are designated for the different forms of aphasia. Naunyn positively succeeded in defining them for motor aphasia, probably for aphasia with word deafness, and doubtfully for the third form—Naunyn's undefined aphasia. Leva looks for the cause of this incompleteness in the paucity of useful cases. Leva has several such cases at his disposal, which may be used for entering into Naunyn's synopsis. In the first case there existed total aphasia with marked sensory aphasia, strictly localized pathological lesion in the middle portion of the upper temporal convolution, 2 mm wide, extending to the upper margin of the middle temporal convolution. In the second case, the above-mentioned places were intact, whilst the immediately adjoining, the lower margin of the middle and the entire lower temporal convolution, were occupied by a circumscribed lesion with a trace of aphasic disturbance. Whilst the first case illustrates the strictly localized sensory aphasia, the second case furnishes a natural counter-experiment, which proves exactly that cerebral portions closely adjoining to the cortical fields of aphasia may be affected without producing aphasic disturbances. In the third case there existed purely motory aphasia with typical localization in the lower frontal convolution. In the fourth case a purely sensory aphasia was again associated with a typical lesion in the first temporal

convolution, but in addition the lowest portion of the third frontal convolution was implicated without signs of motor aphasia. Furthermore Leva reports three homogeneous cases of marked aphasic disturbances without microscopically visible lesions in the supposed centres; but in all these three cases lesions were found in the left lenticular nucleus, which extended at different distances toward the cerebral cortex and the island without reaching them. The author explains this by circulatory disturbances in these centres. Effects from the distance existed indeed in two of these cases with serous swelling of the cortex toward the fossa Sylvii on the frontal and the temporal cerebrum respectively. If in these three cases death had not occurred within from one to three weeks, the aphasic disturbances had, according to the author, gradually ceased. If, therefore, aphasic disturbances exist but for a brief period or cease completely within a short time, we should be quite reserved as to the diagnosis of localization. Former observations in this direction are not quite unobjectionable. Moos.

NOSE AND NASO-PHARYNX.

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48. RANGÉ has examined Jacobson's organ in oxen and sheep, in which it may be readily investigated. The paper was illustrated by drawings and specimens. GELLÉ.

49. VEASEY from his experiments and cases believes to be justified in reaching the following conclusions :

1. Cocaine phenate can be used in cases of idiosyncrasy to cocaine hydrochlorate without producing systemic effects.

2. In order to produce the same degree of anæsthesia as with cocaine hydrochlorate, stronger solutions of the phenate are required.

3. But the anæsthesia produced by the phenate lasts fully as long.

4. The phenate is preferred in some cases on account of its antiseptic properties. M. TOEPLITZ.

50. FREUDENTHAL considers strict antiseptics to be impossible before and after operation. He operates with sterilized instruments and aseptic hands. In the after-treatment he discards plugging and dressing. He has returned to the open after-treatment and believes that antiseptics, especially sublimate, destroy the physiological function of the nasal mucous membrane. He avoids after-infection of the wound from any outside source. Irrigations of the nose with lukewarm sterilized water or with Javelle's solution of salt and soda before and spreading of collodium over the protective coagulated blood after the operation is all that is required. M. TOEPLITZ.

51. The various petroleum products such as vaseline, albolene, benzoinol, etc., have crowded out many of the old astringent drugs and justly so. Vegetable and mineral astringents irritate and inflame the nasal mucous membrane. Oily preparations are harmless, protective, and thus sedative agents, furnishing non-irritating vehicles for cocaine, oil of pine needles, menthol, resorcin, etc. ; the blandness of the oil softens the irritation, but long continuation of oily sprays produces dryness of the surfaces and contraction of the erectile tissues, which look much like atrophy. Oily sprays are beneficial in cases with congestion and without extreme obstruction. Watery astringents are beneficial in atrophic rhinitis. Disinfecting sprays are invaluable in atrophy,

ozæna, syphilis, polypi, and suppurations. The most useful method of spraying is that with the up-tip spray into the nasopharynx, which is much preferable to the douche; mild solutions of astringents are here used with safety and benefit. The solutions for spraying should not be cold nor be propelled with great pressure, fifteen pounds being sufficient for the anterior nares.

M. TOEPLITZ.

52. In acute, subacute, and chronic inflammations the glands suffer most and succumb the earliest. They should, therefore, not be destroyed by galvano-cautery, but kept open by constant irrigations with water, or rather with alkaline watery fluids. This should be continued for a long time before operative measures are resorted to. No after-treatment is required in intranasal operations except to control hemorrhage, since the nasal secretions cannot be made aseptic. The intranasal tissues possess considerable power of resistance to the entrance of infectious agents. Watery douches and sprays are contra-indicated in the first stage of acute coryza and in young children. Wright gives also the precautions in using either spray or douche. He prefers for his own use in the office the post-nasal syringe and is greatly opposed to the up-tip spray for the naso-pharynx. Oily sprays are to be used when watery sprays are contra-indicated, viz., in acute inflammations. Oil cannot be used as a vehicle for antiseptics. Wright has, except in cocaine and antiseptics, little faith in the drugs applied for nasal therapeutics.

M. TOEPLITZ.

53. SUCHANNEK has made careful microscopical examinations of ten cases of acute rhinitis, which were connected with pharyngitis and laryngitis crouposa and diphtheritica and he gives their detailed descriptions. He emphasizes these changes in the epithelium upon the surface of the mucous membrane and within the glands. In extreme inflammation, the epithelial cells may be at places completely thrown off. The replacement of the epithelium of the surface takes place from the cellular remnants in the lacunæ and emissary ducts of the glands. Suchannek explains these conditions by very instructive illustrations. We refer for the study of details to the original.

KILLIAN.

54. ABBOTT has examined three cases of rhinitis fibrinosa, of which the membranes of the first two were found to contain numerous colonies of bacillus diphtheriæ, which when inoculated

into guinea-pigs caused the death of the animal in less than forty-eight hours. Cultures made from the membranes of the third case, which was observed in a sister of the patient of the second, were morphologically and biologically identical with those of Loeffler's bacillus, but when inoculated did not cause the death of the animals. The cultures obtained from the second case were also found to be devoid of vitality after thirty days. The difference of virulence may explain the variations of intensity frequently observed also in true diphtheria. Abbott is inclined to designate the micro-organism of fibrinous rhinitis as an attenuated or non-virulent bacillus rather than a bacillus of pseudo-diphtheria. The bacilli derived from gelatine or agar-agar cultures are small, pointed, and well-staining, while those from blood-serum and broth are long with swollen ends and staining irregularly.

M. TOEPLITZ.

55. The methods of application used by ESCHERICH are as follows: (1) Syringing of antiseptic fluid (sublimat 1:1000) directly upon the pharyngeal mucous membrane; (2) wiping of the pharyngeal cavity by means of sponges dipped into sublimat solution.

POLLAK.

56. SUCHANNEK examined microscopically the margin of a simple perforation of the septum (Votolini) and found: "metaplasia of the superficial epithelium into pavement epithelium. In the tunica propria, the adenoid tissue, situated immediately below the membrana propria appears horizontally situated with yellow pigment cells. The deeper layer of the tunica propria is cicatricial, the glands are degenerated and atrophic, containing colloid. No giant cells and no tubercle bacilli are present." Furthermore, the author communicates two cases of acute perichondritis of the septum from his practice, both without subsequent depression of the nasal dorsum, one without definite etiology, the other with preceding traumatism.

SIEBENMANN.

57. Tubercular tumors of the nose are very rare in children when compared with tubercular ulcers. In CHIARI's case the cartilaginous septum of the left side exhibited an irregular tumor of the size of a hazel-nut, bleeding readily upon touch. It was removed with the cold snare, the base destroyed by the sharp spoon and galvano-cautery. A remaining ulcer healed in a few weeks. The histological examination revealed giant and epithelioid cells and also partly caseous nodules with tubercle bacilli.

The lungs were and remained sound. This case was one of primary nasal tuberculosis. Bok.

58. In the first case reported by DIONISIO a circumscribed tumor consisted of tubercular tissue, in the second an ulceration with tubercular granulations were located upon the septum.

GRADENIGO.

59. The case is interesting on account of the extensive destruction in the oral cavity from which the tuberculous process was propagated into the maxillary sinus. POLLAK.

60. COZZOLINO reports the result of the histological examination of a sarcoma with polymorphous cells upon the nasal septum and discusses the different forms of malignant tumors occurring in the nose.

GRADENIGO.

61. In addition to two observations of sarcoma teleangiectaticum of the septum, published by Gouguenheim and Hélyar, DANTAL describes in his paper (with drawings) a third case of this rare new-formation.

GELLÉ.

62. From nine fully reported histories of cases JACQUEMART deduces the principles according to which nasal polypi should be operated in order to avoid relapses. He, therefore, completely destroys in the most careful manner even the smallest remnants of polypi and the hypertrophied tissue in the adjoining parts partly with the snare, partly with the galvano-cautery. The relapses are only prevented by such extremely careful operations which, if necessary, should be performed at several sittings. Bok.

63. Cephalalgia is a very frequent symptom in nasal and pharyngeal affections. It develops frequently from the nose, if the nasal fossæ, through swelling of the mucous membrane, are naturally narrow or if retention of secretions takes place. In the pharynx, principally tumors (adenoid vegetations, polypi) and local inflammations produce cephalalgia. Affections of the nasal accessory cavities play also an important part. The treatment has to direct its attention to the point of issue, which may be readily ascertained with the probe. The therapeutic procedure depends upon the diagnosis. Bok.

64. GRADENIGO directs the attention to the frequent occurrence of vertiginous phenomena in nasal affections. Four cases are reported, one of which deals with the cure of asthma by the treatment of the nose.

GRADENIGO.

65. Among nervous reflex phenomena of nasal origin GRADENIGO mentions the occurrence of vertigo and pseudo-angina as

being very rare. He gives four observations of the first and one of the second class. In every case physiological abnormalities were found in the nose, after the removal of which the pathological phenomena disappeared. The symptoms of pseudo-angina pectoris are the same as those of angina pectoris hysterica.

BOK.

66. In an hereditary case of melancholy the hypertrophied turbinated bodies, which had been supposed to be pathogenetic, were removed with the cold snare. In spite of the removal of the primary exciting cause the main condition persisted after improvement of short duration and the compulsory conceptions and impulses reappeared.

POILLAK.

67. The affection, comparatively frequent in Texas, is well illustrated by a case in which the larvæ of the *sarcophaga georgina* (Wiedemann) were deposited in the nostril of the sleeping patient, the fly being attracted by the odor of an old ozæna. Injection of pure chloroform only, after many futile trials with other remedies, cured the patient, from whom more than three hundred maggots were ejected. The patient had become delirious, eyes were extremely swollen, and deglutition was so much impeded by swelling as to necessitate feeding with stomach-tube. The maggot fully develops in forty-eight hours. KIMBALL collected seven cases, all of which but one proved fatal. All cases had suffered from previous ulcerative processes of the nose with ozæna. Of all remedies experimented with upon maggots none acted so promptly and thoroughly as chloroform.

M. TOEPLITZ.

68. MADEUF discusses the different kinds of nasal obstruction, their etiology, and pathological consequences, viz., coryza chronica, pharyngitis chronica sicca, diseases of the eye (blepharitis, conjunctivitis, etc.), affections of the hearing organ (retraction of the membrana tympani, displacement of the ossicles, disturbances of hearing), furthermore laryngitis stridulosa, deformation of the thorax, disturbances of nutrition. Of especial interest are seven photographs of a patient with adenoid vegetations taken at different ages.

BOK.

69. ROE's method is as follows when the soft parts are preserved : "The thickened ridge of tissue of the dorsum is incised through to the under side of the skin on both sides, a short distance from the septum at a point where it thinned into the alæ nasi. The skin is then raised from the dorsum and the flaps turned upward and held in place by small ivory splints, having holes through

which sutures are passed from one to the other through the flaps and tied without strangulating the parts." In extreme cases, in order to increase the solidity of the septum, each side of its lower portion and the floor is scarified and the anterior portion of the septum divided, leaving the front portion of the skin intact. The flaps from the floor are turned upward and held together as above and the upper borders are united by sutures to the cut portion of the septum. The nose is kept in position by spiral springs until healing takes place. The paper is well illustrated by photographs.

M. TOEPLITZ.

70. The instrument used by DE ROSSI for straightening the septum consists, like those of Adam and Jurasz, of two steel blades covered at their inner surface with elastic rubber. The blades are introduced separately and approached by a screw.

GRADENIGO.

71. The object of this paper is the diagnosis of malignant disease of the nose. DOUGLASS distinguishes between local, general, and so-called malignant symptoms. Local symptoms are identical with those produced by a foreign body. General symptoms are hypersecretion, fulness in the head, headaches of different kinds, supra-orbital and quintus neuralgia, deformities by displacement, symptoms from obstruction of the nasal foramina and reflex symptoms. Symptoms of malignancy are infiltration, hemorrhage, ulceration, and pain; the first being also the earliest and a sero-sanguineous, offensive discharge from the nose always being suspicious of malignancy. The *distinctive* clinical features are appearance, deformity, age, deposits, and locality. The color of sarcoma varies from a red or a bluish-red to a gray; the carcinoma has no characteristic coloring. The consistency of sarcoma is hard; carcinoma lacks a well-defined consistency and ulcerates more rapidly. Carcinoma presents early a general cachexia of the patient which is absent in sarcoma. The latter produces deformities by displacement of normal structures, whilst the deformities of carcinoma are produced by ulceration without displacement. Douglass concludes his remarks by pleading for the use of the microscope in diagnosis of nasal diseases only after a matured differential diagnosis made after exhaustive clinical research.

M. TOEPLITZ.

72. BRYAN's patient, a woman aged twenty-eight, derived her affection from influenza, suffering also at the same time from caries of the upper left second molar tooth. The left nostril became stenosed, secreting thick, fetid masses from the front of

the nose and into the naso-pharynx. There existed severe pain over the nasal bridge, extending over the infra-orbital ridge, also extreme pain upon pressure on the eyeball, and crepitating sensation at inner angle, but no exophthalmus. Two polypi were found attached to the left middle turbinated body. The left antrum was found to be affected, and was opened from the alveola of the affected molar. The redeveloped polypi were removed and withal a small spicula of bone, thus establishing an opening, through which on the following day the ethmoid abscess evacuated spontaneously thick, caseous masses, giving immediate and permanent relief. Bryan prefers for operation the snare and sharp spoon to the drill.

M. TOEPLITZ.

73. BROWN dwells fully upon the anatomy of the maxillary sinus and the etiology, symptomatology, and diagnosis of its diseases. For differential diagnosis he lays much stress upon transillumination, believing that its umbræ are rather caused by infiltration and thickening of the mucosa than by the presence of pus. In cases of atrophic rhinitis he has found sub-orbital umbræ without pus, and has given much relief after perforation and irrigation of the sinus. Sounding and irrigation through the natural opening are difficult and did not prove to be satisfactory measures. Injections of peroxide of hydrogen through the semilunar hiatus are also valuable for differential diagnosis. Exploratory puncture from the lower meatus, alveolus, alveolar hypophysis, or canine fossa were also practised. The first method is advocated for diagnostic purposes only, the second is thoroughly condemned, whilst treatment from the natural ostium maxillare, or, better, by perforating the alveolar hypophysis, are highly recommended. Brown performs the last-mentioned operation by casting out a circular piece of mucous membrane with a tubular knife, just below the gingivo-labial fold, between the roots of the second bicuspid and first molar, and drilling upward, inward, and backward into the most dependent part of the sinus. The proximal end of the drainage-tube is fastened by a collar or clasp to a tooth. As a more radical measure, Robertson's method of operating and searching from the canine fossa is approved.

M. TOEPLITZ.

74. BLAIR does not agree with some writers, notably Bosworth, that tertiary syphilis of the naso-pharynx shows but little tendency to take on a destructive or spreading condition. The diagnosis of gumma in the naso-pharynx is strengthened by Pick's brick-red arch along the arcus palatoglossus and the intolerable

stench characteristic of necrosis. He illustrates the disease by a case which occurred in a patient, aged thirty-five, who presented himself with obstruction of both nostrils lasting three weeks, and swelling and pain in the throat, causing great difficulty of deglutition. There existed also tinnitus, lancinating pains in head, headache in vertex, dizziness, staggering gait, temporary unconsciousness, nausea, and great prostration. History of syphilis of twelve years' standing. Perforation of septum and of palate at the junction of soft and hard palates was associated with fetid discharge and characteristic odor. Necrosis of the sphenoid probed through the palatal opening was gradually loosened and removed through the mouth. The sequestrum represented at least one half of the body of the sphenoid, showing the sphenoidal sinus completely on one side. Blair warns against the use of force in removing the sequestrum.

M. TOEPLITZ.

75. ROBERTSON believes that diseases of Highmore's antrum, even when producing a few symptoms, cause various disturbances of the nose and ear, which can only be removed by treatment of Highmore's antrum. He recommends to make an opening in the anterior wall of the size of a sixpenny-piece, and keep it open in a suitable manner.

76. Désault's method of opening Highmore's antrum (from the fossa canina) ought, according to GUÉMENT, to be more frequently practised, since it is in some respects preferable to the other methods. From this opening, *e. g.*, more efficacious insufflations into the maxillary sinus can be made than from another. The entrance of the numerous microbes of the oral into the maxillary cavity is rendered difficult. Cowper's method is to be used only if carious teeth constitute the cause of suppuration. An exact observation of a case of suppuration of Highmore's antrum is appended.

BOK.

77. In a patient, aged sixty, with epistaxis, posterior plugging had been made in consequence of an alarming hemorrhage. The bleeding ceased. After forty-eight hours the patient categorically refused the removal of the tampon, which on the tenth day was permitted on account of the offensive odor. Antiseptic irrigations were ordered, but chills appeared for two days notwithstanding. Profuse, offensive, muco-purulent discharge persisted for one month. The patient refused to be examined. After his return a year later, muco-purulent discharge still persisted.

GELLÉ.

78. CARTAZ gives a synopsis of the different methods of treating empyema of Highmore's antrum, discussing them successively. For unsuccessfully treated suppuration of long duration he recommends the opening of the maxillary sinus from the fossa canina and its curettement. Intense hemorrhages resulting therefrom may be readily stopped by plugging. Partition walls in the cavity should be removed. Bok.

79. MOURE recommends, for ascertaining the suppuration of Highmore's antrum, the perforation of the external nasal wall by means of a galvano-cautery point. This method is to be preferred to that with the pointed troicarts, not requiring particular pressure, which may produce fractures of the nasal frame. After the perforation, antiseptic injections are made by the author. Bok.

80. The tumor, weighing 112 grammes, measuring 11 *cm* in length, 6 *cm* in width, and 3.50 *cm* in thickness, filled the entire lower pharyngeal cavity and could be traced by palpation into nasopharynx and close to the aditus laryngis; a cylindrical portion 5 *cm* long, reached the left nasal cavity up to about 1½ *cm* behind the nasal entrance. ZAUFAL revolved the tumor by means of the index and middle fingers into the oral cavity. He then embraced the tumor with the index and middle fingers of each hand, then placed also the thumbs upon the anterior surface of the tumor and thus removed the tumor, pulling it off its insertion by gradually increasing force. No hemorrhage. Five days subsequently an intense hemorrhage suddenly appeared through the left nostril, which was stopped by plugging. Both ears were then seized with otitis due to streptococci which terminated in complete recovery after five weeks. POLLAK.

81. The different forms of sequelæ of nasal cauterization are divided into those: (*a*) with sufficient, (*b*) with excessive, cauterization; (*c*) with an intermediate effect between the two former; and into (*d*) such cases, which are never reached by the cautery. The discussion of the paper brought out the fact, that galvano-cautery is an excellent measure when properly used by skilful and judicious rhinologists. M. TOEPLITZ.

82. WYETH corrects the flattening of the wing of the nose by advancing the anterior portion of the anterior maxilla of the deficient side. He drills a hole about half an inch from the anterior edge of each maxillary bone through the bone and holds the trimmed edges, brought in contact by advancing the bone of the short side, detached between the two teeth by means of soft wire

inserted into the holes. The loosened bone is nourished from the soft portions, which are not operated upon before eight weeks after the first procedure. The method and result of the operation are illustrated by drawings and photographs. TOEPLITZ.

83. SOLIS COHEN distinguishes between rheumatic and non-rheumatic cases, the former requiring also constitutional, the latter topical treatment only. In rheumatic cases he prescribes a six-ounce solution, containing four fluid drachms of ammoniated tincture of guaiac and ninety grains of sodium salicylate, to be used as a gargle and internally. In folliculous tonsillitis, a ten per cent. solution of cocaine is swabbed over the parts and plugs of sebum, desquamated epithelium and bacteria are removed with the scoop; in severe cases scarification or incision is resorted to. For infiltrations of the neck, heat or a fifty per cent. ichthyol ointment is used. For rheumatic cases he prescribes salol, thirty grains daily, which in cases of carbolic poisoning by salol is to be substituted by salicylate of sodium, oil of gaultheria or cinchonidine salicylates. Anæmic patients receive a mixture of iron chloride with sodium salicylate; convalescents and recurrences cinchonidine salicylate, in the latter preceded by a saline cathartic. In non-rheumatic cases Cohen alternates the guaiac gargle with sprays of peroxide of hydrogen. Tonsillitis from influenza is treated with cinchonidin salicylate and sodium benzoate internally, and peroxide of hydrogen and injections of ichthyol topically.

M. TOEPLITZ.

84. KOHN reports a case of follicular tonsillitis with dysphagia and difficulty in speaking, in a man, aged forty-five, which was not relieved after expressing the cheesy masses. This was followed by hard swelling of the submental connective tissue, extending to the left side, without marked glandular swelling, but with infiltration of the connective tissue of the subparotid and submaxillary region. The tongue was swollen to twice its natural size. Temperature $101\frac{1}{4}^{\circ}$ F., pulse 108 and good. The patient was dead on the following morning. Kohn considers this case as an exact analogon to that described by Senator in the *Berl. klin. Wochenschr.*, No. 5, 1888.

Arpad Gerster, in a letter to the editor of the *Medical Record*, takes exception to the diagnosis of the case, which he considers as one of angina Ludwigi, and which he would have treated by incision into the submaxillary gland.

Kohn, in reply to this letter, points out that a follicular tonsil-

litis, with œdema of the left oro-pharynx and infiltration extending to the parotid without marked glandular swelling, is not indicative of angina Ludwigi, which he understands to be a primary inflammation of the deep-seated submental and sub-maxillary connective tissue.

M. TOEPLITZ.

85. BULKLEY found among 2000 cases of syphilis, 110 instances of extra-genital chancres, of which 15 chancres of the tonsil come next in frequency to 49 chancres of the lip. The sexes of the patients with chancre of the tonsil were almost evenly divided, there being eight males and seven females; the ages ranged from eleven to forty-eight years. The right tonsil was affected alone in nine cases, the left alone in three cases, and both together in three cases. Bulkley illustrates the disease by two typical cases, giving as the most important diagnostic feature the hardness of the tonsil, which is to be made out by palpation and also sub-maxillary and post-cervical adenopathy of the affected side. Syphilis arising from tonsillar chancre generally runs a very severe course. The modes of infection consisted in three cases in vile, bestial practice with their own sex, in ten other cases from kissing or a drinking cup, whilst in two instances no probable hypothesis could be made.

TOEPLITZ.

86. SENDZAK recommends for removal of hypertrophic tonsils the use of the galvano-cautery snare. This method is preferable to tonsillotomy, since hemorrhages are thus wellnigh completely avoided. Cocaine produces perfect anæsthesia. Narcosis is unnecessary. In very small or unmanageable children tonsillotomy is to be preferred.

BOK.

87. HUNTER MACKENZIE reports 250 tonsillotomies. In most cases a ten per cent. solution of cocaine was used, the hemorrhage never alarming; the operation was always done with good success, in two cases only the tonsils returned. In aural affection tonsillotomy was insufficient, and treatment of the naso-pharyngeal cavity had to be added.

SECOND MEETING OF THE GERMAN OTOLOGICAL SOCIETY.

At Frankfort-o.-M., on May 20 and 21, 1893.

Reported by Dr. E. BLOCH, Freiburg-i.-Br.
Translated by Dr. MAX TOEPLITZ, New York.

The meetings were held at Leuckenberg's Institute.

First Meeting Saturday, May 20th, from 9.30 A.M. until 1.30 P.M.

1. DERKER, Hagen-i.-W., demonstrates specimens and communicated contributions to the *Anatomy and physiology of the middle ear and labyrinth of some mammals*, especially of the horse. Manometer experiments yielded analogous results with those found in man by Politzer and Bezold.

Discussion : Kuhn, Bezold, Lucae.

2. VOHSEN, Frankfort-o.-M., demonstrated *Corrosion specimens of the human ear*, made according to Siebenmann's perfected method.

Discussion : Siebenmann, Seligmann.

3. SIEBENMANN, Bâle, briefly reports his new examination of the *vascularization of the cochlea and vestibule* and explains them by illustrations and specimens. Three arteries and three veins supply the inner ear ; in both scalæ, there exist arteries *and* veins, but the principal veins are situated in the tympanal, arteries in the vestibular scala.

4. LEMCKE, Rostock, treats of the question, whether *osteosclerosis* was to be considered as protective arrangement for the ear, and answers it in the negative. The reported cases make it rather appear as a dangerous complication of chronic suppurative processes. Extradural abscesses, cholesteatomata, labyrinthine necrosis are more frequently associated with osteosclerosis of the temporal bone.

Discussion : Oscar Wolff, Bezold, Seligmann, Hartmann, Lucae.

5. A. HARTMANN, Berlin, demonstrated two specimens with *thickening of the external meatus*, principally of the spinæ of the tympanic ring. The author did not observe that these small tubercles increase markedly in the course of time. He explains their development embryologically.

Moos communicated similar conditions many years ago.

Discussion : Lucae, Koerner, Moos, Kuhn, Hartmann, Kretschmann, Bezold.

6. BEZOLD, Munich, *Extraction of the stapes*. Caused by the American reports, the author performed this operation in a case of large defect of the right membrana tympani with adhesion of the handle of the malleus to the promontory: Whisper, A.D., $\frac{1}{2}$ inch; A.S., 4 inch. Loud convers.: A.D., 4 inch; l. $\frac{1}{2}$ inch; Tuning-fork: A.D. = C only, A.S. up to A.; G. 1. 7, or A.S. 2.3 turns respectively; Rinné A.D.—7", A.S.—15" (for a'). A (Schwabsch) A. D., prolonged; A. S., shortened. In extraction, periosteum, cartilaginous covering of the plate, and annular ligament were left in the ear. Hearing power *after* operation: Whisper, A.D. = 0, after three weeks; other ear, lower limit A, G. A. D. 2.3. After initial absolute deafness (c" and f major" only were perceived through the air), improvement took place, but not to the status quo ante.

Discussion : Lemcke, Ludw., Wolff.

7. KOERNER, Frankfort-o.-M., demonstrated a *sequestrum* from a mastoid process operated three years previously.

8. KUHN, Strasburg-i.-E., reports some cases and demonstrates specimens of sinus phlebitis and of *carcinoma of the middle ear*.

Discussion : Jansen.

9. v. Wild, Frankfort-o.-M., reports a case of pyæmia in acute affection of the *mastoid process*. In percussion with his and Koerner's hammer, dulness was found over the diseased bone.

Discussion : Eulenstein.

10. EULENSTEIN also discusses *pyæmic metastases* in acute affections of the *temporal* bone, narrating the full history of such a case and its various clinical symptoms.

Discussion : Kuhn, Koerner, Szenes.

11. JANSEN, Berlin, communicates some interesting and rare complications from the *mastoid process*.

Second meeting, Saturday, May 20th, at from 3.30 P.M. until 5.30 P.M.

12. KOERNER, Frankfort-o.-M., discusses the *intracranial complications of caries of the petrous bone*, especially during childhood, meningitis and cerebral abscess. These take in children a somewhat different course from that in adults. In the former the meningitic irritation symptoms are prevalent, less severely, however, than other symptoms. In addition, other affections, especially tuberculous cerebral affection, frequently render the diagnosis difficult. Brief report of three cases of this character.

13. KRETSCHMANN, Magdeburg, furnishes a contribution to the study of *optic cerebral abscess*. A case of abscess in the temporal lobe after acute suppuration of the ear was not recognized *before* the autopsy. The second case was diagnosed in time and operated. The author emphasizes the fact that abscesses ought, if possible, be looked for from the petrous bone, the tegmen tympani, or the roof of the antrum. The abscess is then found at its lowest place and favorable surgical conditions are established for the healing.

Discussion : Vohsen, Lucae, Koerner, Kretschmann, Kessel, Jansen, Eulenstein.

14. MOOS, Heidelberg, reports the course of a *mastoiditis*, as it has heretofore not been described with burrowing abscess and infiltration in the nape of the neck on either side of the vertebral column. Simultaneously, there exists a reflux of the pus through the fissura squamo-mastoidea into the middle ear and the external meatus. Repeated enormous discharges of pus emptied with the assistance of massage ; vertigo, and subjective noise disappeared together with the abscess.

Discussion : Kessel, Moos.

15. L. WOLFF, Frankfort-o.-M., reports the simultaneous occurrence of severe *inflammations of the middle ear in three children of one family*. Three of the four children of that family affected with catarrh of the upper ear passages, were seized with decrease of hearing from acute otitis media. Neither originated in an acute exanthematous affection nor in pneumonia, but principally staphylococcus pyogenes aureus were demonstrated.

Discussion : Moos.

16. L. WOLFF. Presentation of a case of congenital *atresia of both external meatus* without deformity of the auricles. The latter is a well-known concomitant of atresia.

Discussion : Hartmann, Moos, Kessel.

17. VOHSEN, Frankfort-o.-M., demonstrated *two cured cases, operated according to Stacke*, with *persistent* opening behind the auricle.

In the third meeting, held immediately after the second for the transaction of the business of the Society, the city of Bonn was elected as place for the next meeting during Pentecost, and the by-laws of the Society were revised. The annual fee of \$2.50 remains unaltered.

Fourth meeting, held on Pentecost Sunday from 9 A.M. until 12.30 P. M.

18. SIEBENMANN, Bâle, demonstrated *injected specimens* of the ear.

19. SELIGMANN, Frankfort-o.-M., presented a patient with *bleeding from the jugular vein* during *paracentesis* of the membrana tympani.

20. BEZOLD, Munich, demonstrated specimens of *sclerosis* and of *atrophy of the cochlear nerve*.

21. BRESGEN, Frankfort-o.-M., demonstrated a set of *aural specula* made of aluminium and modified by him.

22. BEZOLD, Munich : *Anchylosis of the stapes and nervous deafness*. Bezold gives another post-mortem examination for establishment of the diagnosis in these cases with extreme deafness, negative Rinné, prolonged bone-conduction, absence, as there invariably is in sclerosis, of the lower end of the tone scale (for aërial conduction), and also of the uppermost tones. Death from carcinoma. Stapes entirely immovable, partly with osseous adhesions. Atrophy in the first cochlear turn. In another in case, patient, aged thirty, typhoid fever, who, the left ear, had perceived only from D to a', atrophy in the left cochlea was found.

Discussion : Lucae, Kessel, Hartmann, Bezold.

23. BEZOLD : Remarks on the continuous series of tones. Bezold uses tuning-forks down to sixteen vibrations, the whistle for high tones, and Galton's whistle for the highest notes.

24. LUCAE, Berlin : New critical experimental examinations of the diagnostic value of examinations for tones by means of tun-

ing forks. Speech is a much more reliable means of examination than the tuning-fork. Defects at upper limit of the gamut (nervous affection) are alone of importance. The paper cannot suitably be criticised in a brief review.

Discussion is declined according to a vote taken, in order to give the remaining papers an opportunity to be read.

25. MOOS makes some remarks upon the *low tuning-forks of Appun*, which have been mentioned in the preceding number of these Archives.

26. HAUG, Munich: The *ear and erysipelas*. The latter may affect the external or middle ear, more frequently the former, either primarily or secondarily. The histories illustrative of the author's view, had, as we regret to state, to be omitted on account of lack of time.

27. JANSEN discusses the *opening of the accessory cavities of the nose*. The malar cavity should be widely opened from without, plugged with iodoformed gauze for a few days, and then closed with an obturator. The lower wall of the frontal sinus only should be removed after a curved incision below the eyebrows, without interfering with the anatomical orificial duct.

Discussion : Bloch.

28. JANSEN briefly discusses the *different methods of mastoid operations*. He prefers Zaufal's method, but recommends Stacke's plastics in order to obtain a permanent opening. To prevent the rapid return of cholesteatomatous masses, all osseous niches within reach should be carefully exposed.

Discussion : Stacke, Kretschmann, Hartmann.

29. H. SZENES, Budapest, communicated a case of objective *aural noise*, which was not synchronous with the pulsation and independent from the respiration, but depended upon muscular contraction.

30. KRZYWICKI, Koenigsberg, demonstrated specimens.

31. LUCAE, Berlin: *Massage of the nasal mucous membrane*. He believed that the excellent effect, according to his own subjective experience, in fact, depended upon massage. Catheterization is a kind of massage. He devised a catheter-like, solid instrument, in order to perform slowly sliding movements in the nose.

Discussion : Vohsen.

32. HARTMANN, Berlin, demonstrated various *instruments for the ear and for the nose* and its accessory cavities.

33. AVELLIS, Frankfort-o.-M., also demonstrated instruments.

34. FLATAU (Berlin) did the same.

35. SELIGMANN, Frankfort-o.-M., explains his apparatus for vibratory massage, worked by electric current.

The order of the day was thus exhausted. The meeting was a great success.

BRITISH NOTES.

SOCIETIES.

MIDLAND MEDICAL SOCIETY.—At a meeting held on April 5, 1893, Mr. Chevasse read a paper on "Lateral Pharyngotomy as a Method of Treating Malignant Disease of the Tonsil," and the paper was published in extenso in the *Lancet* of June 10th. One incision was made from the lobule of the ear to the cornu of the hyoid bone, and another from the latter point to the angle of the mouth, dividing the cheek. The tonsil was removed through the V-shaped opening thus formed, all the soft parts being first divided. At the end of the paper the reader will find an interesting résumé of the history of the lateral operation.

ROYAL ACADEMY OF MEDICINE IN IRELAND.—At a meeting of the surgical section held on May 12th, Dr. C. B. Ball read notes of a case of abscess in the temporo-sphenoidal lobe in a girl of seventeen who had had otorrhœa for nine months, and upon whom he had operated. The abscess was reached through a trephine opening made directly above the external meatus, and so placed that the lower margin was half an inch above the roof of the meatus; over an ounce of pus escaped on the day of the operation. The patient made a perfect recovery.

BRITISH MEDICAL ASSOCIATION—BORDER COUNTIES BRANCH.—At the meeting held at Keswick on May 12th, Dr. MacLaren of Carlisle read notes of two cases in which he had trephined for temporo-sphenoidal abscess, following suppurative middle-ear disease.

SOUTH MIDLAND BRANCH.—At the meeting held at Northampton on June 8th, Mr. W. G. Nash, of Bedford, read notes of a case of chronic otitis media; septicæmia; exploration of the mastoid antrum and lateral sinus; recovery.

SHROPSHIRE AND MID-WALES BRANCH.—At the meeting held at Shrewsbury on June 27th, Mr. T. R. Cæsar showed a case of internal-ear deafness which had benefited by the prolonged use of hypodermic injections of pilocarpin.

INTERCOLONIAL MEDICAL CONGRESS—SYDNEY, 1892.—We have just received the verbatim report of the papers and discussions upon diseases of the nose, throat, and ear at this Congress. The report is made up in the form of a pamphlet of forty-five octavo pages, and contains much interesting matter.

Papers upon post-nasal growths were read by Drs. Barrett and Webster, by W. F. Quaife, M.B., and by Dr. Gibson, and in the discussion which followed Drs. Hamilton, Hozier, Kenny, Nihill, Kenna, and Brady took part. A paper upon "Nasal Disease as a Casual Factor in Affections of Adjacent Parts and Distant Organs" was read by C. H. S. Hozier; one on "Thyrotomy for Papilloma of the Larynx in Young Children," by Dr. Lendon; on "A Form of Senile Otasthenia," by W. F. Quaife, M.B.; on "A Case of Parasitic Disease of the Pharynx," by Dr. Dick; on "Hypertrophy of the Lingual Tonsil," by Dr. Hamilton; and on "A Combined Vapor-Inhaler, Tympanum Inflator, and Nasal and Aural Insufflator," by H. P. Slogett. Apart from the intrinsic merit of the individual papers, which is considerable, our colonial brethren are to be congratulated upon their energy in having collected into one convenient form such a valuable record of their work.

BRITISH LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION.—At the meeting held on June 30th, reference was made to the question of malignant disease of the tonsil, which is just now occupying so large a share of attention. Drs. MacIntyre, Grant, and Wolfenden, and Mr. Mayo Collier related cases of this description.

PLYMOUTH MEDICAL SOCIETY.—At the meeting held on October 4th, Mr. Woollcombe showed for Dr. Fox, a woman aged forty, from whom recurring tumors on both auricles had been removed at intervals of twenty-three, sixteen, nine, and six years. They varied in size from that of a walnut, and were considered to be keloid in character.

BRITISH MEDICAL ASSOCIATION.—Annual General Meeting held at Newcastle-on-Tyne, August, 1893. In addition to Mr.

Bendelack Hewetson's address as President, many communications of interest and value were made to the section of otology. The following papers were published in more or less detail in the *British Medical Journal* of September 9, 1893, viz.:

"Treatment of Chronic Suppuration of the Middle Ear by Excision of the Auditory Ossicles," by Dr. W. Milligan. This is a very valuable contribution to the subject, on which Dr. Milligan is undoubtedly a great authority. The main conclusions to which the author arrives are, that the proceeding should be adopted after other local means have been well tried without success, that the main difficulty is in the narrow field of operation, and that occasionally unpleasant after-effects, such as vertigo, facial paralysis, etc., arise.

Mr. G. Metcalfe, M.B., B.S., records five cases in which he administered pilocarpin hypodermically, but was not pleased with the result; he speaks, however, in favor of its local application through a Eustachian tube. In the debate following this paper all the speakers expressed disappointment at the results of the hypodermic injection of this drug.

Dr. Robertson contributes papers on the "Implication of the Ear in Diseases of the Nose and Naso-Pharynx"; "The Influence of Oral Breathing"; "Eustachian Synechiæ."

Dr. Walter Browne, of Belfast, related particulars of a case in which the prong of a fork two inches long had been removed from the mastoid cells after impaction for nineteen years.

Dr. Milligan showed a new form of intra-tympanic syringe arranged upon the principles of the ordinary hydrostatic douche.

"The Symptoms and Treatment of Septic Infection of the Lateral Sinus as Illustrated by Ten Cases" is the title of a paper by W. Arbuthnot Lane, M.S., and a case of this sort was also reported by Mr. Hugh E. Jones, of Wigan.

In addition an instructive discussion upon the surgical treatment of mastoid diseases and its complications was introduced by Prof. William Macewen, the other speakers being Professor Horsley, Mr. Hugh E. Jones, Dr. William Hill, Dr. Robertson, Mr. Rushton Parker, and Dr. Milligan. The chief point about this discussion was the remarkable unanimity with which the necessity for surgical treatment was insisted upon. Dr. Adolph Bronner, of Bradford, also contributed notes of sixty cases of mastoid disease in which the antrum was opened.

MISCELLANEOUS.

It is with great pleasure that we have to record that the Select Committee of the House of Commons have agreed to recommend the main principle of the bill relating to the education of deaf-mutes.

"Cholesteatoma of the Mastoid Cells" is the title of a short article in the *Lancet* of May 13th, by A. Marmaduke Sheild. After reviewing what is known concerning the history and pathology of this condition, Mr. Sheild relates particulars of an interesting case that had come under his care at Charing Cross Hospital. The patient was a young girl of drowsy, stupid aspect, and complaining chiefly of persistent headache; she was also quite deaf on the affected side, and had facial paralysis. Simply scraping out the caseating debris was followed by only temporary relief, and it was not until the outer shell of the containing cavity had been thoroughly removed with the mallet and gouge that any permanent improvement could be detected. The change in the patient's mental condition after this operation was most marked.

Mr. Richard Lake in the *Lancet* of May 27th draws attention to the possibility of a localized inflammation of the posterior superior quadrant of the tympanic cavity, and points out that the various structures which effect the shutting off of this portion are the tendon of the tensor tympani, the descending process of the incus, the stapes, stapedius, and pyramid, and the chorda tympani. He recommends that after incision the middle ear should be irrigated with a sixth per cent. salt solution passed through the Eustachian tube by means of a catheter.

In the *Lancet* of June 3d Mr. Wherry, of Cambridge, relates how he removed a bluebottle from the external meatus. A curious and interesting point in the narrative is, that with the fly were also washed out a number of small white maggots, although only about a quarter of an hour had elapsed from the time of its insertion. Mr. Wherry accounts for this on the supposition that the bluebottle commonly hatches its eggs in its own body.

In the same issue of the same paper, Dr. Bond gives a detailed account, with engravings, of the case of myxo-chondroma of the larynx removed by him in September, 1892. The patient recovered and was shown at the Clinical Society of London on April 28th.

A case related by Mr. Edward Jessop in the *British Medical Journal* of June 10th is instructive. Mr. Jessop had removed the tonsils from a child by guillotine on April 28th. On May 2d hemorrhage set in, and was checked with some little difficulty. Two days subsequently fresh hemorrhage occurred, and this time in a more severe form, ceasing only on the repeated application of a strong solution of perchloride of iron; the child was apparently in considerable danger. This case illustrates very well the undoubted fact that until the wounded surface has healed we can never be quite safe, and this is the history of many recorded fatal cases.

The length of time that a foreign body may exist in the external meatus, without causing appreciable inconvenience, is well illustrated in the case recorded in the *Lancet* of June 10th, by Mr. Edward J. Pritchard, of Chiswick. There does not appear to be any doubt that in this instance a pea had been thus retained for twenty-one years. In commenting upon this case, Mr. Pritchard advises the use of a fine wire snare in those cases in which "syrring is contra-indicated." We cannot help thinking, however, that such contra-indication but seldom arises, but, on the contrary, that there are but few, if any, foreign bodies which cannot be dislodged by the judicious and skilful use of the syringe, and that in by far the majority of cases it is the use of wire snares, scoops, hooks, etc., which is most strongly contra-indicated.

In the *Lancet* of June 24th, Mr. T. Gann, of British Honduras, relates the case of a creole woman who had died suddenly from the rupture of a tonsillar abscess into the larynx, causing suffocation.

Mr. J. D. Hillis, of Dublin, contributes to the *Medical Press and Circular* of July 5th a short paper upon adenoid growths. Mr. Hillis believes that, except in refractory patients, anæsthesia is not necessary, but he does not state the proportion of refractory to unrefractory patients, nor does he draw the line very distinctly between those cases in which general anæsthesia is rather a matter of convenience than absolute necessity. In operating Mr. Hillis prefers to use some form of ring-knife.

In the treatment of epidermic masses plugging the external auditory meatus, Surgeon W. Eames, R.N. (*British Medical Journal*, July 8th), advocates frequent instillations of a ten %

solution of Barff's boro-glyceride, and repeated gentle syringing until the masses are removed.

In the *British Medical Journal* of July 22d Mr. Lennox Moore figures and describes a modification of the ordinary Thudichum's nasal speculum. The modification consists in the fact that the speculum is fixed to a stem, the handle of which can be held by the patient himself, thus liberating both hands of the operator.

From a recently published volume (vol. 3) of the Census Report for 1891, we gather that there were in England and Wales in that year 1492 deaf and dumb people. Of these the majority appear to be males until the age of seventy-five is reached, when the conditions as to sex are reversed.

In the *Lancet* of August 19th is a translation by Dr. St. Clair Thompson of a clinical lecture by Professor Adam Politzer on chronic suppuration of the middle ear.

In the same issue of the same journal, Mr. Richard Lake reports two interesting cases of diseases of the horizontal semicircular canal. The first was in a male, aged twenty, who had suffered from left otitis media, with suppuration, since childhood. On touching a polypus growing from the middle ear, vertigo of a side-to-side character ensued, and on removal of the polypus the patient nearly fell towards the opposite side. This vertigo was subsequently reproduced on touching the cicatrized stump of the polypus with a probe. The second case was in a boy, aged thirteen, who had suffered from otitis for eleven years. Similar symptoms, together with lateral nystagmus, were produced on syringing through a sinus connected with the attic and external meatus. Mr. Lake bases his diagnosis largely upon the analogous conditions produced experimentally in animals on section of the horizontal semicircular canals.

In a clinical lecture at St. George's Hospital on the diagnosis and treatment of thrombus of the lateral sinus in connection with middle-ear disease, Mr. William H. Bennett has made a valuable contribution to our knowledge of the subject. The lecture was delivered on February 7, 1893, and is published in the *Lancet* of September 9, 1893, and is well worthy of careful study. Mr. Bennett tabulates the differential symptoms between acute mastoiditis and a thrombus in the sinus, and insists strongly upon the importance of localized tenderness over a small area in the imme-

diate neighborhood of the mastoid foramen. Two interesting cases are quoted. In one, for reasons assigned, no operation was performed, and the patient died, Mr. Bennett expressing the belief that had surgical interference been undertaken, a different result might have been looked for. The second case quoted was more typical both symptomatically and in the success which attended the operation.

The operations referred to by Mr. Bennett have almost ceased to become mere surgical curiosities, but are rapidly being looked upon as routine methods of treatment, and included in the already long list of the triumphs of modern surgery; triumphs partly due to the discovery of anæsthetics, and partly to the introduction of antiseptic methods of operating. Hardly a week passes without the details of one or more of such operations being placed upon record. From August 19th to October 28, 1893, six cases were reported, excluding those referred to at the British Medical Meeting. Of these six cases only one died, and the recovery in the others appears to have been perfect in every sense.

In the *Lancet* of September 30, 1893, Mr. C. Mansell Moulin gives interesting details of the plan adopted by him in the removal of a naso-pharyngeal polypus attached to the internal pterygoid bone at its junction with the sphenoid. The essential point of the plan adopted appears to be that the skin is not entirely reflected from the surface of the superior maxilla, but the latter with the skin attached is freed from its connections and turned to one side, readily falling into its place again when the tumor has been removed. The operation was performed on December 3, 1892, and up to the time of writing there had been no recurrence of the growth, the parts had united very well, and the line of incision was in no way conspicuous.

A curious case of cholesteatoma of the auditory canal caused by a bug is recorded by R. E. Scholfield, M.A., M.B., in the *Lancet* of October 14, 1893.

The report of the Commission on Blind and Deaf Children is now almost a matter of ancient history, and it is upwards of three years since a bill was passed embodying their recommendations as applied to Scotland. On August 4, 1893, the corresponding measure for England and Wales was reported as amended to the House of Lords, so that it is just possible that the act will come into force in the course of the next twelve months. The English

bill, though an improvement upon the existing state of affairs, is still much less satisfactory than the corresponding Scotch measure.

APPOINTMENTS.

BROOK, WM. FRED'K, F.R.C.S. Eng., L.S.A., has been appointed Medical Officer for the Throat and Ear Department of the Swansea Hospital.

RIDLEY, WALTER, M.B., M.S., F.R.C.S., has been appointed Surgeon for the Throat and Ear Department of the Royal Infirmary, Newcastle-on-Tyne.

Book Reviews.

I.—Dr. L. JACOBSON, Privat-Docent in Berlin. **Text-book of Otology for Physicians and Students.** [Leipsic], Geo. Thieme, 1893. Abstract from the German review of Prof. H. STEINBRÜGGE in Giessen. By Dr. GEO. MORGENTHAU, Chicago.

The author is well qualified by his experience of sixteen years in the University Ear Clinic and Policlinic in Berlin, with its wealth of material, to add another German text-book on diseases of the ear to the already large number. Our attention is attracted by the eminently practical virtues of the volume. It is couched in clear and intelligible language, affording pleasant reading; all the more because the author selects the most important and essential parts, without lacking in completeness. The very sensible introduction, in which the great necessity of otological instruction for all physicians is justly urged, is followed by a longer division devoted to the anatomy of the ear, and general diagnosis and general therapeutics of aural diseases. More attention is justly given to the external and middle parts of the ear,—which have a greater practical bearing,—while the labyrinth is briefly described.

The chapter treating of the differential diagnosis between diseases of the apparatus for the conduction and for the perception of sound, proved of especial interest to the reviewer. He can but regret that Jacobson has disdained to quote him as holding the same view. Five years ago, in his article "On Tests with Tuning-Forks," he declared it to be his opinion that the conducting apparatus extends into the labyrinth; that, therefore, the apparatus for perception begins only with the nerve cells; that it is often impossible to differentiate between the various diseases of these parts on the anatomical and physiological basis; that functional diseases of the auditory nerve *cannot* be demonstrated by anatomi-

cal examination. He agrees fully with Jacobson that labyrinthine diseases are not of rare occurrence, and has always contended that labyrinthine complications are of much greater frequency in middle-ear affections than is generally held. Tests with tuning forks are insufficient just because they give us no information in regard to the frequently found combinations of middle- and inner-ear troubles. However, it must be acknowledged that Jacobson once again discusses these points frankly and clearly unlike most other treatises.

In the part devoted to "Special Pathology and Therapy of Aural Diseases," Jacobson distinguishes between Otit. med. simplex ac., Otit. med. ac. purulent., perforativ., and Otit. med. catarrh. ac. Since the author very justly concedes that there are "transitional forms" of middle-ear troubles, we might perhaps restrict ourselves to the division into so-called catarrhal and purulent inflammations until better knowledge of the causes of diseases will permit a division on an etiological basis. In regard to therapeutic measures, there is hardly anything to be modified. The numerous prescriptions will prove of great assistance to beginners. All aural diseases, in their manifold aspects, are fully and concisely treated.

Three hundred and eighteen illustrations of the normal and pathological anatomy as well as of aural instruments, enhance the value of the work. Print and paper are exemplary. Altogether, the reviewer can commend the book highly to every one interested in the study of otology. He will find everything he needs in the most acceptable form.

II.—E. J. MOURE (Bordeaux): **Manuel Pratique des Malades des Fosses Nasales, de la Cavité Naso-Pharyngienne et des Sinus de la Face.** 2d Edition. Duodecimo, 602 pages with 127 figures in the text and four lithographic plates. Paris, O. Doin, 1893. Bound, 8 francs.

This second edition of Dr. Moure's book, completely remodelled and from 300 pages increased to 600, is brought up to date and presents the essentials of the new and vigorously growing specialty it treats of in a most attractive form. There is nothing heavy in it to weary the reader, even the most common diseases, such as coryza, are described interestingly. The anatomy of each part is clear and to the point, helping the student by very numerous, good illustrations. The book is introduced by chapters on the examination and general therapeutics of the nose and naso-pharynx,

then follow the deformities, and an elaborate description of the special diseases in the classical manner, beginning with a definition of the disease, then discussing the etiology under the heading of predisposing and occasional causes; the symptomatology, as general and local signs; the course, duration, and termination of the disease; its differential diagnosis, complications, prognosis, pathological anatomy and, quite explicitly, with an abundance of practical rules, the treatment. The adherence to this dogmatic plan, with carefully arranged divisions and subdivisions, is greatly to the advantage of the student and practitioner. Many of the drawings, especially anatomical ones, are original. The individuality of the author shows most in the practical part, yet the literature is well considered, especially the German, less so the English and American. The book is what it aims to be, a *practical manual*.

H. K.

III.—DR. OTTO KÖRNER: **Die Otitischen Erkrankungen des Hirns, der Hirnhäute und der Blutleiter.** (The Otitic Diseases of the Brain, the Meninges, and Venous Sinuses.) J. Alt, Frankfurt-on-the-Main, 1894.

This handsomely printed 8vo volume of 163 pages is an "elaborate and critical presentation of the actual standpoint of our knowledge" of the above department of medicine. It is divided into a general (24 pages), and a special part (127 pages), with a good index.

The general part begins with statistical data, describes the anatomical conditions, the primary aural affections, and the influence of their location on the intracranial complications, the mechanism of the infection, and the prevention of otitic brain disease.

The special part treats of pachymeningitis and epidural abscess, otitic purulent leptomeningitis, aural and meningeal tubercular affections, sinus thrombosis, otitic pyemia and cerebral embolism, and otitic brain abscess. The latter occupies the bulk of the monograph, 68 pages. He describes in detail the diagnosis, pathology, and operations of otitic brain abscess, adding three not yet published cases, one from his own practice. He gives abstracts of all the cases thus far made public, omitting such as are only incidentally mentioned, all of which may fairly count as failures; for instance, Agnew¹ speaks of nine cases of otitic brain

¹ Transactions Am. Surg. Assoc., vol. ix., 1891.

abscess operated on in Philadelphia, of which we only learn that all patients have died. Our author, p. 145, says: Of the 55 abscesses which thus far have been evacuated, 29 ended in recovery, 26 in death. The reviewer thinks that these statistics are unreliable, for the publications on which they are based are mostly made at too early a period to warrant the permanency of the recovery. They cannot, of course, be used to represent the mortality of the operation. The reviewer has two cases of his own: the one published in these ARCHIVES in 1892, fatal; the other, operated on three months ago, successful thus far.

Körner's monograph is exceedingly interesting reading. It leans on the well-known treatise (*Hirnchirurgie*) by Von Bergmann, 1889, but treats of the subject more from the standpoint of the aurist, which will make it particularly valuable to our readers.

H. K.

IV.—WM. MACEWEN, M.D., Glasgow: **Pyogenic Infective Diseases of the Brain and Spinal Cord—Meningitis, Abscess of the Brain and Infective Sinus Thrombosis.** London and New York, Macmillan & Co., 1893. \$6.

V.—WM. MACEWEN, M.D., Glasgow: **Atlas of Head Sections.** Fifty-three engraved copper plates of frozen sections of the head, and fifty-three key-plates with descriptive texts. Macmillan & Co. \$21.

For a long time the reviewer has not had such a genuine enjoyment, he may call it a medical treat, as that given him by the perusal of the above works. We say perusal for the exact study which has and is sure to follow requires more time than is at our disposal before the conclusion of the forthcoming number of these ARCHIVES. The atlas is a handsome volume of photogravures with explanatory key-plates opposite, showing in successive sections all the topographical relations concerned in the operations on the various parts of the head. "The surgeon who is about to perform an operation on the brain has in these cephalic sections a means of refreshing his memory regarding the position of the various structures he is about to encounter. At any spot which he may select for his operation he has the relation of the various parts of the brain to the outside of the skull exposed in three different series of sections—coronal, sagittal, and horizontal. In both the coronal and horizontal series the adult sections are supplemented by those of the child." The brief in-

introduction gives some very valuable hints, perfect gems, regarding the practical points in the study of the plates.

The atlas is supplemented by the first named work, an 8vo volume of 354 pages, profusely illustrated by many excellent drawings. The two publications together form a library on this newest and most brilliant achievement in medical science and art.

CHAPTER I. gives a description of the surgical anatomy of the ear and brain, with many physiological and pathological observations. 48 pages.

CHAPTER II. Pathology of cerebral abscess and meningitis. Pp. 49-129.

CHAPTER III. Symptoms of abscess of brain and meningitis, excellent and exhaustive, with very many original illustrative cases (for instance, eight of word blindness and psychical deafness), the localizing symptoms of abscess in the temporo-sphenoidal and occipital lobes and the cerebellum. Elicitation of differential percussion notes. The three stages of abscess: initial, declared, and terminal. Differential diagnosis and prognosis. Pp. 130-225.

CHAPTER IV. Thrombosis of the intracranial sinuses. General and special description. Pp. 226-299.

CHAPTER V. Treatment. Detailed rules, not only for the performance of operations on the brain, but also those of the diseases of the ear, nose, or skull that are apt to lead to intracranial complications. Pp. 291-325.

CHAPTER VI. Results. After a short chronological statement, the author gives his own results.

Of 54 cases of mastoid operations, 43 cured, 11 relieved.

Seventeen cases of infective pachymeningitis externa in which operations were performed.

The granulation tissue covering the dura mater, and the pus, varying in quantity from a few drops to a couple of drachms, were removed. The extent of the tegmen and the sigmoid groove eradicated depended on the extent of the granulation tissue springing from the dura, sufficient bone being removed to expose, if possible, the limits of the pachymeningitis. All these 17 cases recovered.

Twelve cases of infective purulent lepto-meningitis, of which 6 were operated on and recovered; 5 being of the cerebral, 1 of the cerebellar fossa. Five cases exhibited symptoms of purulent lepto-meningitis at an early period. A free incision showed the

tegmen eroded, the dura inflamed, softened, and bathed in pus ; purulent intradural exudation escaped, generally in drops, and continued to ooze for some time. These cases recovered. Others, which were seen at a later period, were beyond hope, and died. Purulent lepto-meningitis is the most serious of the infective brain diseases, and hopeless when generalized.

Of 6 cases of cerebro-spinal lepto-meningitis, 5 were operated on with 1 recovery.

In 28 cases of infective sinus thrombosis which were operated on there were 8 deaths.

In 25 cases of abscess of the brain 19 were operated on, of which 18 recovered.

Of 30 cases of intracranial abscess, 17 were cerebral, 8 cerebellar, and 5 extradural.

The author evidently has given his whole soul to this work, and, apart from Horsley, perhaps, nobody has had a more extensive practice or better results. Enthusiasm only will inspire such an enterprise and sustain such indefatigable exertion both in the scientific and practical fields, but enthusiasm is also inclined to look at its achievements in a rosy light. How far or how little the results in the work under consideration are colored, our author lets the reader judge for himself by detailing 54 of his cases, an unprecedented number, and very interesting and instructive reading they are. His book certainly is the most advanced presentation of this department of medicine, written in the best scientific spirit, realistic throughout, and altogether fundamental.

H. K.

VI.—E. ZUCKERKANDL : **Normale und pathologische Anatomie der Nasenhöle und ihrer pneumatischen Anhänge.** First vol., 2d enlarged edition. Braumüller, Vienna, 1893.

The first volume of Zuckerkandl's classical treatise on the normal and pathological anatomy of the nasal fossæ and their pneumatic appendages appears in a revised and greatly enlarged edition, the text having been brought from 197 to 399 pages, the plates from 22 to 34. The chief supplements by which the present edition has been enriched are : 1st, a series of facts taken from the comparative anatomy of the osteology of the nasal cavities ; and 2d, detailed descriptions, illustrated by many beautiful figures, of the vascular system and the histology of the nose. Our readers know how eminently scientific and practical this

admirable work of the professor of anatomy at the Vienna University is. All we need do is to mention this new edition, which is sure to meet with the same enthusiastic welcome which the first edition received when it appeared in 1882 and which has been so extensively copied in text books and serial literature.

H. K.

VII.—CHAS. H. BURNETT: **System of Diseases of the Ear, Nose, and Throat.** Two octavo volumes of 789 and 858 pages respectively ; illustrated. J. B. Lippincott, Philadelphia, 1893.

This large enterprise is a collection of monographs by a number of prominent workers in the various departments of ear, nose and throat surgery. Part I, the ear, begins with a very clear description of the anatomy and physiology of the ear, including the tests of hearing, by W. S. Bryant. Then follow articles on the examination of ears, with instruments and methods of their employment, by H. Richards ; malformations, morbid growths and injuries of the auricle, by E. B. Dench ; otitis externa, containing a very elaborate description of otitis externa parasitica, with drawings of a great variety of fungi, by R. Barclay ; foreign bodies and osseous growths, by Sir W. B. Dalby ; membrana tympani and acute otitis media, by Gorham Bacon ; chronic catarrh, by Sam. Sexton ; the middle ear affected from general diseases, by C. J. Colles ; chronic purulent otitis media, by C. H. Burnett ; removal of the stapes [an irrational operation] by F. L. Jack ; inflammation of the mastoid, by Cl. J. Blake ; diseases of the inner ear, by E. D. Spear ; aural diseases in ocular and systemic disturbances, by C. A. Oliver and A. H. Cleveland.

In Part II., the nose and naso-pharynx, we find the following chapters : Anatomy and physiology, by A. W. MacCoy, with many old and poorly executed figures ; methods of examination, by S. M. Dabney ; general therapeutics, by Cl. Wagner ; acute rhinitis, by F. H. Bosworth ; influenza and American grippe, or epidemic myxoidœdema, by Carl Seiler ; hypertrophic rhinitis, including hypertrophy of the pharyngeal tonsil, by R. W. Seiss ; cirrhotic (atrophic) rhinitis, by J. N. Mackenzie ; lupus, tuberculosis, syphilis, glanders, and diphtheria of the nares and naso-pharynx, by G. W. Major ; foreign bodies in the nose and epistaxis, by Creswell Baber ; diseases of the accessory sinuses of the nose, by J. H. Bryan.

The second volume continues Part II. as follows : Morbid growths and deformities of the nasal cavities, by C. Seiler ; sur-

gical procedures in deformities and neoplastic growths in the nose [very good], by W. C. Jarvis ; hay-fever by F. H. Bosworth ; neuroses of the nose and naso-pharynx [inordinately long], by J. S. White ; diseases of the eye dependent on diseases of the nose, by G. M. Gould ; skin diseases of the nose, by L. D. Bulkley.

Part III. treats of the diseases of the pharynx and larynx on 633 pages, distributing the labor among many laryngologists.

From the foregoing it is evident that we have before us a large work produced by a galaxy of authors, all men whom we would like to consult in the different departments which were allotted to them by the editor. The book, as a whole, is an excellent store-house for reference, though, it seems to us, it disappoints in many particulars. Most of its text and the great majority of the drawings are either reproductions or remodellings of what we have read before. In regard to originality it falls short of similar books written by one author, say, for instance, the unexcelled treatise on the ear by Politzer and that on the nose and throat by Bosworth. If we compare it with works of its kind we have to mention Schwartz's *Handbuch* of ear disease, with which in many departments it vies in tedious prolixity of exposition, whereas in others it remains far behind the original, for instance, in the classical description of the operations on the ear by Schwartz himself.

H. K.

OBITUARY.

I.—Dr. ROBERT WREDEN, of St. Petersburg, died recently. He was one of the most prominent aurists of Russia, our esteemed collaborator, and a very meritorious contributor to otology, as his paper on "Myringo-mycosis *Aspergillina*" (*These ARCHIVES*, iv., 261), and "On the Etiology and Diagnosis of Phlebitis of the Cavernous Sinuses, and the Value of the Thermometer in Diagnosis of Cerebral Complications of Purulent Otitis" (*These ARCHIVES*, v., p. 75, 1876), and articles on "Thrombosis" and "Phlebitis Sinuum *Duræ Matris*" (*Petersb. med. Zeitsch.*, 1869), testify. Honor to his name.

II.—Dr. GIUSEPPE SAPOLINI, the Nestor of Italian aurists, died in Milan, June 3, 1893. Among his publications the most important is on the Nervus Wrisbergii and the Chorda Tympani, which he called the XIIIth pair of cranial nerves. In 1882 he founded, by a donation of 10,000 frs., an hygienic museum at Milan, which now bears his name, and to which he left a legacy of 90,000 frs.

SUPPLEMENT TO THE PAPER "ON SERO-MUCOUS CYSTS BENEATH THE WING OF THE NOSE," PAGE 67, ETC., OF THE PRESENT VOLUME.

By HERMAN KNAPP.

WHEN the printing of this number was almost completed, a report of "A Case of Cystic Tumor of the Floor of the Nose," by John Dunn, M.D., of Richmond, Va., appeared in the issue of Feb. 24, 1894, of the *N. Y. Medical Journal*. As this communication adds another to the few cases thus far made public in American medical literature, as far as I know, I beg to present it, in abstract, as a supplement to my short paper on this anomaly.

A woman of twenty-six years noticed, three months before she presented herself, a small swelling "in the corner of her nose." It grew steadily. Dr. Dunn found the cheek near the left ala nasi unduly prominent, the suture in a measure obliterated. In the nostril an oblong, fluctuating, painless tumor extended from the septum to the outer wall, $\frac{3}{4}$ " backward, $\frac{1}{4}$ " in depth. A hypodermic needle thrust into the tumor removed a syringeful of a thick, transparent, yellowish fluid. The tumor was opened with a knife, its contents forced out, and the cavity packed with a $\frac{1}{4000}$ solution of bichloride of mercury. For a few days the cavity was washed out daily with a boric acid solution, then with tincture of iodine, following which it gradually diminished in size, until, in five weeks, a complete cure resulted.

Dr. Dunn, finding no connection of the swelling with any of the neighboring structures, thinks that it must be classed as a retention cyst of the floor of the nose. As to its cure, he says: "In regard to the treatment of these cystic tumors

(ranula, etc.), I would say the best results obtained at my hands have been from excising a portion of the sac wall, filling the sac with tincture of iodine, which is immediately washed out, and then packing the sac with cotton, which is to be changed daily until obliteration of the sac has taken place." This would be according to what I have called the second method of treatment: destruction of the interior surface of the cyst by heat or chemicals. It is a simpler operation than the extirpation, but slower in healing, and open to relapses, especially if the lateral part, which extends underneath the ala nasi under the cheek, is not quite small. The treatment of Dr. Dunn's case lasted five weeks, and his article, announcing the perfect cure by the last of December, '93, appeared in print as early as Feb. 24, '94.

SUPPLEMENT TO THE COMMUNICATION OF
"REMOVAL OF SEQUESTRA AND A TOOTH
FROM THE FLOOR OF THE NOSE."

By HERMAN KNAPP.

WHEN I read the above communication before the N. Y. Laryngological Society on Feb. 28, '94, Dr. Jonathan Wright, of Brooklyn, mentioned that he had published two personal cases, and referred to several others in an article contained in the issue of Oct. 12, 1889, of *The Med. Record*. As this article had escaped my notice I take the liberty of copying from it what is essential to the above subject.

The presence of a tooth in the nose is a very rare circumstance. There is a record of one case,¹ where a right upper canine tooth was removed from the left orbit of a child. This was evidently a dentigerous cyst, which must have begun development at a very early stage of embryonic life. Many cases of dentigerous cysts have been reported, and they are not by any means confined to the maxillary regions.

Dr. Wyeth,² several years ago, reported to the New York Pathological Society a case in which a displaced tooth was found in the antrum of Highmore. Dr. Griffin³ found a tooth growing upward in the nose in a case of cleft palate. This produced no symptoms. Dr. Marshall,⁴ and Dr. Ingalls,⁵ of Chicago, have each reported a case in which the tooth had apparently ulcerated through into the nose, from the upper jaw. It is doubtful how the teeth in the

¹ Cousins, J. B. : *British Medical Journal*, 1887, p. 873.

² Wyeth : *New York Medical Journal*, November 24, 1883.

³ Griffin : *New York Medical Record*, March 13, 1886.

⁴ Marshall : *Journal of American Medical Association*, November 6, 1886.

⁵ Ingalls : *Journal of American Medical Association*, February 23, 1884.

cases reported by Schaeffer,¹ Roy,² and Hall³ became nasal inhabitants. These six cases are all that I have been able to find recorded, after a careful search, though other reports may have been overlooked. In all the cases reported the teeth were the anterior ones, canines or incisors; and the reasons are obvious, since the posterior ones, if inverted, as in Griffin's case, would grow into the antrum, and probably produce no symptoms. I have seen skulls in which a tooth had attained full growth within the alveolar process of the superior maxilla without emerging from the bone at any point. Where ulceration takes place, the progress of a bicuspid or tricuspid upward would be very unlikely to occur, from the shape of its root. If it should occur, as in the case of Wyeth, it would, from its situation, be most likely to be discharged into the antrum.

The first of the cases related here is instructive as illustrating the migration of an object through bony structure, while the second case was evidently originally one of extra-alveolar development.

CASE I.—Mary V—, aged thirty-five; married; came to the Demilt Dispensary February 21, 1888. Four years previously she had all her remaining teeth, nine in number, extracted from the upper jaw. The last one, a lateral incisor or canine, on the left side, she had extracted during nitrous oxide narcosis. The dentist told her he thought he had left a piece behind, but could not detect it on probing. There was a good deal of gingival tenderness afterward, which soon subsided. Six months later, the left side of her nose began to trouble her, by being "stopped up" at times, and there was a slight discharge. For the last six months the nose on the left side had been painful and sensitive. An intra-nasal examination showed marked hypertrophy of the nasal mucous membrane on the left side. It was red and inflamed, and bled easily. A probe detected a rough, hard surface about an inch and a half from the left anterior meatus, on the floor of the nose and close to the septum. The patient was given an alkaline wash with a syringe. Two weeks later she again presented herself, bringing with her a small, flat, sequestrum which she had washed out of her nose. After the thorough application of cocaine, by means of a probe and the forceps the single root of a tooth, about three fourths of an inch long, was extracted from the left nostril. The nasal symptoms soon subsided.

¹ Schaeffer: *Deutsche Med. Woch.*, No. 2, 1883.

² Roy: *London Lancet*, November 3, 1883.

³ Hall: *London Lancet*, November 17, 1883.

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CASE II.¹—Mary F—, aged eight. From her second year the nose had been stopped up so as to prevent nasal breathing. There had been considerable offensive discharge. The bridge of the nose was sunken. The nostrils were flattened and contracted. The superior alveolar process on the left side, corresponding to the situation of the incisor and canine teeth, was absent, leaving a slight cleft. No history of accident could be obtained, the mother stating that she had never noticed the defect before. The left nostril was obstructed by a foreign body, which gave a grating sound on the impingement of a probe. Considerable force was necessary to extract it with the forceps. It was found to be the crown of an incisor tooth. It was notched, as in young children, and larger than in a child a year old. There was considerable calcareous matter around it and in the nostril, but no root was found. The patient's nasal symptoms had very markedly abated at the next visit, and since then she has not been seen.

¹ This case came under the observation of my assistant, Dr. F. A. Manning, during my absence. To him I am indebted for the notes of the case.

Erratum.—On page 68, sixteen lines from below read:
“smooth resistant walls” instead of “small resistant walls.”

